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A POLAR RECONNAISSANCE

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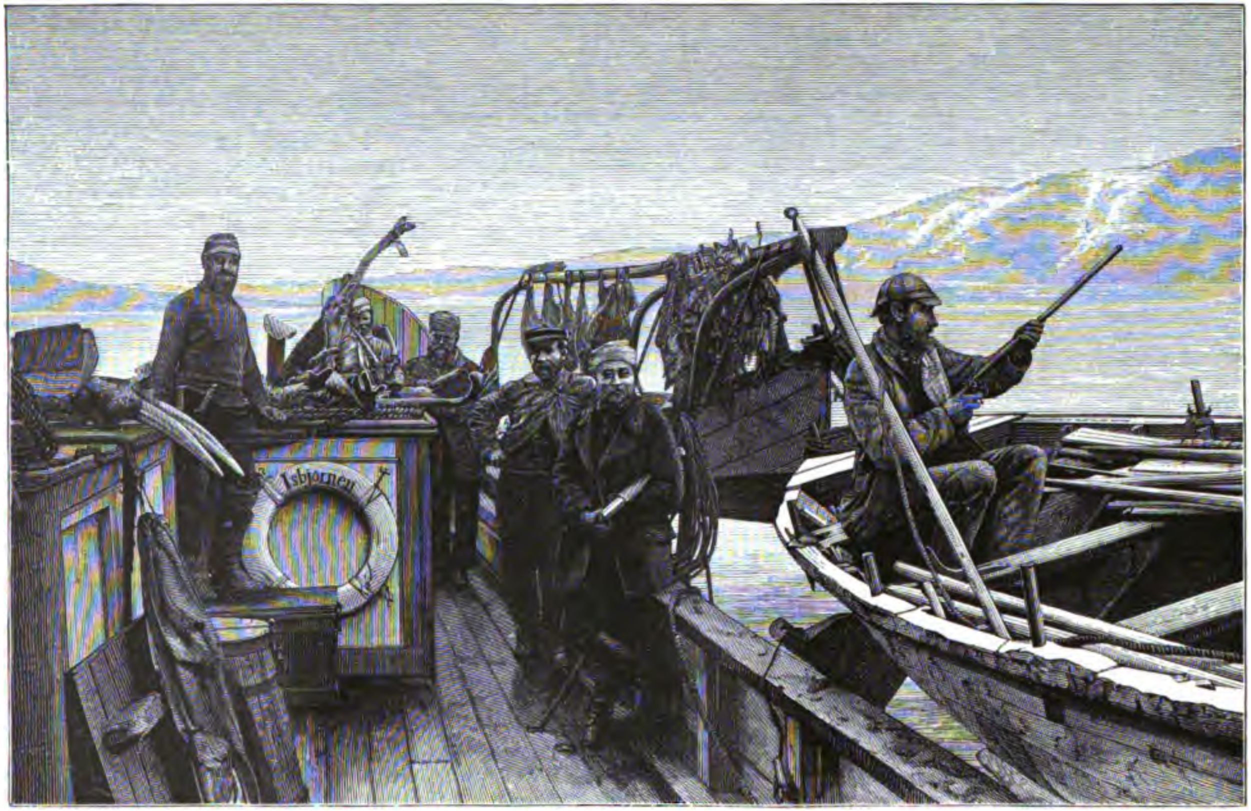

GROUP ON BOARD "ISBJÖRNEN."

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A

POLAR RECONNAISSANCE

BEING

THE VOYAGE OF THE "ISBJÖRN"

TO NOVAYA ZEMLYA

IN 1879

BY

ALBERT H. MARKHAM, F.R.G.S.

(CAPTAIN, ROYAL NAVY)

WITH MAPS AND ILLUSTRATIONS.

LONDON
C. KEGAN PAUL & CO., 1, PATERNOSTER SQUARE
1881

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TO MY FRIEND

SIR HENRY GORE BOOTH, BART.,

I DEDICATE THIS NARRATIVE OF THE CRUISE OF THE "ISBJÖRN,"

IN PLEASANT REMEMBRANCE OF OUR COMPANIONSHIP

IN THE ARCTIC SEAS.

Export Book 3 11-4-53

PREFACE.

THE narrative of the voyage of the *Isbjörn* was written soon after Captain Markham's return from his polar reconnaissance, but his employment on active service prevented him from seeing the sheets through the press.* In presenting the narrative, with its introductory historical chapters to the public, it will be well to give some account of Captain Markham's previous Arctic work, and of the conclusions to which his experience and researches have led him.

Albert Markham has been a volunteer for Arctic service, and has taken a keen interest in northern discovery, ever since the year 1865, when Sherard Osborn's memorable paper † stirred the hearts of all the active young spirits in our navy. But it was not until 1873 that he was offered his first chance of gaining a knowledge of ice navigation. In promoting the despatch of an expedition of discovery, Admiral Sherard Osborn considered it desirable that a naval officer should proceed to the Arctic regions in a whaler, and return with a full report of all he had seen and experienced. He selected, for this service, Commander A. H. Markham, who made a cruise in the whaler *Arctic*, from May to August, 1873, acquiring a knowledge of ice navigation in Davis Strait, Baffin Bay, Barrow Strait, Prince Regent Inlet, and the Gulf of Boothia. The publication of his account of this whaling cruise * was useful, because it helped to arouse public interest in Arctic work. The narrative was preceded by an introduction from the pen of Admiral Sherard Osborn, and it concluded with the memorandum of the Royal Geographical Society's Committee on the scientific results of Arctic exploration.

---

* He is now in the Pacific, in command of H.M.S. *Triumph*, bearing the flag of Rear-Admiral Stirling.

† Read at the meeting of the Royal Geographical Society on January 23, 1865.

When the Arctic expedition of 1875 was determined upon, Albert Markham was appointed Commander of H.M.S. *Alert*, under Sir George Nares. The object of the Council of the Geographical Society, in procuring the despatch of this expedition, was the discovery of the portion of the unknown polar region which could be reached from the direction of Smith Sound. That important object, with all the valuable scientific results embraced by it, was fully attained. During 1875–76, Albert Markham, under the able lead of Sir George Nares, added to his polar knowledge by the experience of two seasons in the intricate channels leading from Smith Sound, and among the stupendous ice floes of the polar sea beyond. He also became a practised sledge traveller both in autumn and spring, and amidst difficulties of no ordinary kind, he planted the Union Jack on the most northern point ever reached by man. These services were rewarded by his promotion to post rank, and were also recognized by the presentation to him of a gold watch by the Royal Geographical Society. Captain Markham's work, "The Great Frozen Sea,"* is a history of this most successful expedition, and especially of the noble endurance and terrible sufferings of his gallant sledge crews.

---

* "A Whaling Cruise to Baffin's Bay and the Gulf of Boothia, and an account of the rescue of the crew of the *Polaris*, by Albert Hastings Markham, F.R.G.S., Commander R.N., with an Introduction by Rear-Admiral Sherard Osborn, R.N., C.B." (1874). 8vo, pp. 310. Map and illustrations. Second edition (1875), small 8vo, pp. 307.

On his return from the expedition of 1875–76, Captain Markham gave close attention to the question of the best route for future polar discovery. There are certain Arctic canons which he had learnt from such men as Sherard Osborn, and which were fully confirmed by his own knowledge and experience. One is that, in order to penetrate far into the unknown region, it is necessary to find a coast line trending northwards with a western aspect. The second is that, although much may be done by a vessel during a summer cruise, a winter in the ice, and the employment of extended sledge parties, are essential to the full attainment of the various scientific results of exploration. With these rules as his guides, Captain Markham diligently pursued his study of the subject. Some of the results of his investigations are embodied in his work entitled "Northward Ho!"* which is a monograph of voyages that have had specially for their object the discovery of the North Pole. Captain Markham also edited, for the Hakluyt Society, the voyages and nautical works of John Davis, the Elizabethan navigator, with notes and an introduction.†

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* "The Great Frozen Sea; a Personal Narrative of the Voyage of the *Alert* during the Arctic Expedition of 1875–76, by Captain Albert H. Markham, R.N. (late Commander of H.M.S. *Alert*)." 8vo, pp. 440. Maps and illustrations (1878). Second edition, small 8vo, C. Kegan Paul and Co. (1880), pp. 384. In connection with this expedition Captain Markham also published a biographical notice of Hans, the Eskimo hunter and dog-driver, entitled, "An Ice Hero." See *Good Words* for February, 1880, p. 88, and April, 1880, pp. 269.

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* "Northward Ho! (including a narrative of Captain Phipps's Expedition by a Midshipman) by Captain Albert H. Markham, R.N." Small 8vo, pp. 347 (1879).

† "The Voyages and Works of John Davis the Navigator; edited, with an Introduction and Notes, by Albert H. Markham, Captain R.N., F.R.G.S.," pp. xcv. and 392 (Hakluyt Society, 1880).

His matured conclusion is that the west coast of Franz Josef Land offers the best route for future polar discovery. The great question, therefore, was whether there was a reasonable prospect of successfully navigating the ice-laden space known as the Barents Sea in ordinary years, so as to reach the desired land where discovery would commence.

To decide this point, it was necessary that knowledge should be accumulated by voyages of reconnaissance. Several had already been made by Lieutenant Payer in 1872, and by various Norwegian captains. In 1878 the Dutch explorers De Bruyne and Koolemans Beynen undertook an important voyage during which they traversed the Barents Sea. Captain Markham proceeded to Amsterdam in October, 1878, to welcome them on their return, and to receive from his friend Beynen a detailed account of the nature of the ice on the route to Franz Josef Land. He published an account of the Dutch expedition of 1878, with a preliminary narrative of former Dutch achievements in the Northern Seas, in *Good Words* for February, March, and April, 1878.*

At length an opportunity offered for a personal examination of the ice in the Barents Sea during the navigable season, and Captain Markham eagerly accepted the proposal of Sir Henry Gore Booth, to accompany him to the Arctic regions in the little Norwegian cutter *Isbjörn*. The following pages contain a narrative of the voyage of the *Isbjörn*, during which the west coast of Novaya Zemlya, the Matyushin Shar, and the shores of the Kara Sea were visited; the British flag was hoisted, for the first time, to the north of Novaya Zemlya; and a push was made northwards in the ice between Novaya Zemlya and Spitzbergen. The preliminary chapters give an account of all previous voyages of discovery that have been made in this direction. The chapter on the work of Russians in Novaya Zemlya will be new to most English readers. In his concluding chapter, Captain Markham passes all the experience that has been acquired in review, and carefully sums up the evidence.

---

* "The Dutch Flag in the Northern Seas, by Albert H. Markham." *Good Words*, Part I., February, 1878, p. 90; Part II., March, 1879, p. 172; Part III., April, 1879, p. 244. Map and illustrations.

He was indefatigable in collecting specimens in natural history and geology on every occasion that offered, and the Appendix consists of a report on the plants he collected, by Sir Joseph Hooker, with a catalogue of them by Professor Oliver; a note on his collection of birds by Captain Feilden; and reports on his collections of crustacea by Mr. Miers, of mollusca by Mr. Edgar Smith, of echinodermata by Mr. F. Jeffrey Bell, of fishes by Dr. Günther, of insects by Mr. McLachlan, and of rocks and fossils by Mr. Etheridge.

Captain Markham was fully confirmed, by this polar reconnaissance, in the opinion that Franz Josef Land could be reached in a steamer, in an average season, during August and September; and that the western coast of that land was the best route for future polar discovery. In a small sailing vessel little could be done, but he was convinced that a steamer could, in most years, easily reach and explore the coast of Franz Josef Land.

The correctness of Captain Markham's views has been fully confirmed by Mr. Leigh Smith, in the very next navigable season. That able and intrepid yachtsman caused a suitable steamer to be built at Peterhead during the winter of 1879–80, which he named the *Eira*,* and he sailed from that port on June 29, 1880. Nothing could be done to the north of Spitzbergen, so Mr. Leigh Smith wisely bore up for the Barents Sea. The *Eira* reached the pack ice in 77° 14′ N. on August 6th. On the 14th land was sighted, and Mr. Leigh Smith, during the last half of August, discovered 105 miles of the south-western coast of Franz Josef

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* The *Eira* is a steam vessel of 350 tons gross register, 125 feet long by 25 feet beam, and 50 horse-power. She had a crew of 25 souls all told.

Land, rounded the extreme western point, and ascertained that the land trended northwards with a westerly aspect. He landed at several places, and found that there were anchorages with good shelter and holding ground, where a steamer could wait for opportunities to pass northwards. Leaving Franz Josef Land on August 30th, no difficulty was experienced in proceeding south along the edge of the pack, and Hope Island was sighted on the 10th of September.

This most important voyage completely establishes the fact that the west coast of Franz Josef Land can be reached in ordinary seasons. Here, therefore, is the route for future polar discovery. Here an advanced base may be established within the unknown region, whence scientific results of the utmost interest will be secured: and here the nearest approach to the North Pole can be made.

It is the wish nearest to Captain Markham's heart that he may have contributed his mite, usefully and serviceably, towards securing the resumption, by Englishmen, of the glorious work of north polar discovery on an adequate scale.

CLEMENTS R. MARKHAM,
Secretary R. G. S.

21, ECCLESTON SQUARE, S.W.
November, 1880.

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A
POLAR
RECONNAISSANCE.

CHAPTER I.

INTRODUCTORY.

GEOGRAPHICAL exploration is one of the most fascinating pursuits to which a man can devote his energies and his abilities. This fascination is most powerful when investigations are made in those regions which have hitherto been regarded as almost inaccessible—where nature, assisted by the severity of the climate, combines with all her forces to repel the mortal intruders who strive to solve the mysteries of the Pole.

There are few more noble objects to which an explorer, in the present age, can dedicate his labours than that of discovering unknown regions situated in high latitudes; those wide areas of land, sea, and ice, bounded respectively by the Arctic and Antarctic circles.

To the former region, however, attention has been more continuously attracted. Greater exertions have been concentrated on the exploration of the northern part of our globe than on the southern ; in the first place, because it was at one time thought that a shorter route to India could be discovered in that direction than by making the long sea voyage round the Cape of Good Hope ; and, secondly, owing to the untimely fate of the gallant Sir John Franklin and his crews, and the necessity for examining hundreds of miles of coast line in search of them. Hence the North is in a sense brought nearer home to us English sailors, and is looked upon with greater affection than the stormy and less accessible sea of the South.

To my mind England, as a great maritime nation, should not be content with the unimportant *rôle* which she has of late years played in the grand work of geographical discovery, but, calling to remembrance the brave deeds performed by our forefathers, she should equip expeditions, not only for the exploration of that region culminating at the North Pole, but also for the complete discovery of the whole terrestrial globe!

There are many people who will raise the cry of *Cui bono?* and I fear the majority of the British public must at intervals, but happily not invariably, be included in this category. The cry originates in a want of knowledge regarding the utility of the work and the benefits to be derived from it.

In a strictly commercial sense, these adversaries of a glorious cause are, perhaps, in the right, because at the present time it cannot with confidence be urged that commerce would be directly benefited by the discovery of either the North or the South Poles; but that such discoveries would be indirectly beneficial, there is not the smallest doubt.

When brave John Davis, and the equally gallant and intrepid navigator Hudson, sailed on their voyages of discovery three hundred years ago, it was with a view of finding a shorter passage to India than the one which exposed them to the dangers of tempestuous weather and the hardships and privations incidental, in those days, to a long sea voyage.

Their expeditions, so far as the primary object for which they were despatched is concerned, were unsuccessful; but they were admirable schools for our seamen, and led to the establishment of the whale fisheries, which were, and are, so remunerative to those who have the hardihood to engage in this hazardous, though eminently lucrative, trade.

We must not, however, regard the question of despatching exploring expeditions exclusively from a commercial or money-making point of view. There are other results of a scientific nature, which in time will prove as beneficial to commerce as was the discovery of the habitat of the whale and other valuable oil-yielding animals.

The scientific observations which are made by members of an Arctic expedition are of great practical value, more especially those bearing on the physical geography, geology, and meteorology of the unknown regions.

It is not my intention now to enumerate the results that are likely to be obtained by a well-organized and efficiently conducted expedition despatched to either extreme of our globe, but simply to lay before my readers a brief narrative of an Arctic cruise, in which I have lately been engaged.

After a very careful study of all that has been written on the different efforts that have been made to explore the region situated in the immediate vicinity of the North Pole, I had come to the conclusion that the best field for further successful exploration would be reached by penetrating the supposed icy sea situated between Spitzbergen and Novaya Zemlya.

A cruise in this direction would, I felt convinced, yield important and interesting confirmatory evidence. It was a trip I was most desirous of undertaking, but it was one I was afraid I should never have the good fortune to accomplish.

Numerous difficulties presented themselves. I was not sanguine enough to believe that the Government, in the present unsettled state of affairs, both at home and abroad, would be induced to send forth an expedition in that direction; and that a private expedition should be despatched, in which my services would be required, was, I felt, a most remote contingency.

I had also to take into consideration my own professional career; and, however much my heart and feelings were attracted in a northerly direction, I felt that I was bound to relinquish and sacrifice those inclinations when my services were required in the navy.

A period of enforced professional inactivity enabled me, however, thanks to my friend Sir Henry Gore Booth, during the summer of 1879, to carry out investigations in a comparatively high latitude, in the interesting region I was so desirous of exploring. This locality has rarely been visited by our countrymen, and even those few who have ventured into the comparatively unknown waters of Novaya Zemlya have been yachtsmen, bent more on the slaughter of walruses than on the more interesting work of exploration.

I propose, in the present volume, to present to my readers an account of a trip, the results of which were more satisfactory than even my most sanguine hopes had induced me to expect.

It was whilst cogitating over the glorious field that lies open to the explorer in the Arctic regions, and bitterly lamenting the apparent decadence of the spirit of enterprise in this country, that I received a visit from Sir Henry, who cordially invited me to accompany him on, what he was pleased to call, a sporting trip to Novaya Zemlya.

The very name of the place was sufficient, in itself, to induce me to listen favourably to his kind invitation; for, to me, Novaya Zemlya was a *terra incognita*—a land I little dreamt I should ever have an opportunity of beholding,—a country associated with the gallant deeds of brave navigators of the sixteenth century, and the scene of the hardships and sufferings endured by sturdy old Willem Barents and his heroic band of Dutchmen during the winter of 1596, nearly three hundred years ago! Such an offer was not one to be lightly rejected, yet before it could be accepted, many things had to be taken into consideration.

It was late on Saturday, the 26th of April, that the offer was made. Sanction from the Admiralty had to be obtained before I could think of undertaking such a trip. Sunday would, of course, be a *dies non.* Nothing could be done on that day, and as arrangements had been made for leaving England on Thursday, May 1st, it would leave me but little over two days to make all the necessary preparations for the cruise. It is marvellous, however, how much can be done, even in forty-eight hours, when once the mind is made up! Difficulties that appear insurmountable vanish; obstructions are smoothed over and disappear; and, at the last, ample time is found to devote even to trivial and unimportant affairs.

The primary object of our cruise was to be the pursuit of walruses, bears, and seals; but as sport solely did not offer sufficient inducement to tempt me to visit the interesting and almost, to me, classic shores of Novaya Zemlya, my friend readily acquiesced in the stipulation that when our cravings for the blood, or rather the oil, of seals and walruses had been appeased, we should employ our time in the more important work of the examination of the edge of the pack ice, at a late season of the year, in the northern part of what is now generally known as the Barents Sea.

With this understanding, I gladly accepted the invitation so generously and cordially extended. I have never had reason to regret my decision; on the contrary, the cruise was productive of useful results, and an excellent and genial messmate made it a happy and a pleasant one.

As very little has been published regarding the history of Novaya Zemlya, and as our knowledge of that country is extremely limited, I have deemed it advisable to preface the account of my own cruise and observations with a brief sketch of the geographical work that had previously been achieved in that far-away corner of the globe.

In doing so I propose to devote chapters respectively to the efforts made by different nations, not only for the exploration of Novaya Zemlya, but also for the discovery, along its shores, of shorter routes to India, either by a north-east passage, or by a voyage directly across the North Pole.

These voyages were undertaken principally by the English, Dutch, Russians, and Norwegians, all of whom added more or less to our knowledge of Novaya Zemlya and the surrounding seas.

A sketch of the work executed during former expeditions will tend to throw light on the important question of the navigation of those seas, and on the increase or diminution of the ice during a period extending over three hundred years.

CHAPTER II.

EARLY ENGLISH VOYAGES TO THE NORTH-EAST.

THE name Novaya Zemlya is composed of two Russian words signifying New Land.

When, or by whom, the name by which they are known was applied to these islands are questions difficult of solution.

The name implies that their discovery is due to the Russian nation, and I think it extremely probable, although perhaps it would be difficult to prove, that Russia is legitimately entitled to claim this honour. Nearly all the old European navigators, records of whose deeds have been transmitted to us, allude to the fact of having met Russians along the coasts of Novaya Zemlya, who were making a living by hunting walruses and seals for their fur and oil.

The first authenticated record of its discovery is undoubtedly that of Sir Hugh Willoughby, who, with Richard Chancellor and three ships, sailed from England in the year 1553, on a "Voyage intended for the discoverie of Cathay, set forth by the right worshipfull Master Sebastian Cabota, Governor of the mysterie and companie of the Marchants Adventurers of the citie of London."

Chancellor, in the *Edward Bonaventura*, was separated from his consort on their outward journey off the North Cape, by which fortunate circumstance he escaped the fate that awaited his superior officer. Sir Hugh was especially selected for the command of the expedition on account of the reputation he had established for himself as a soldier, and for his handsome and commanding mien; for we are told, very quaintly, that he was chosen "by reason of his goodly personage, for he was of tall stature," and "for his singular skill in the services of war."

Better would it have been for all connected with the enterprise, had they selected a sailor, like Chancellor, to command the expedition, instead of entrusting it to the conduct of a handsome and valiant soldier!

After parting company with Chancellor, Willoughby, with his two ships, the *Esperanza* and the *Confidentia*, sailed to the eastward until they sighted land in latitude 72°. This coast must have been what is now known as Gooseland, on the west coast of Novaya Zemlya. Thence he sailed to the northward for three days, and finally shaped a course to the south, eventually putting into a small bay on the coast of Lapland, for the purpose of waiting for more favourable weather in order to proceed with his work of exploration. But, alas! that change never came; for, almost immediately after their arrival, the cold, inhospitable grasp of an Arctic winter, with all its attendant miseries, seized them, and they were irrevocably frozen up,

They did not, however, lose heart, nor could they, at the time, have anticipated the dreadful doom that was in store for them. They knew that they were ill provided with provisions, and also with stores and clothing sufficient to enable them to contend with the hardships of winter in the Arctic zone; but they were unable to realize the full extent of the privations to which they would be inevitably subjected.

To guard against all accidents, they took the precaution to despatch several parties into the interior, who made journeys of three and four days' duration, in search of inhabitants and relief; but they all returned unsuccessful.

What a terrible winter must that have been to the crews of the *Esperanza* and *Confidentia!* Short of provisions, insufficiently clad, with ships ill adapted for such a contingency as they were compelled to submit to, is it surprising to hear that Sir Hugh Willoughby, with the entire crews of both ships, without a single exception, numbering in all sixty-five souls, perished from the combined effects of cold and starvation?

Their tragic fate was discovered, in the following year, by some Russian fishermen, who found the two vessels, intact, and still bearing their ghastly crews of stiffened corpses.

How long the unfortunate men lingered, after giving up all hope of relief, it is difficult to conjecture, but from a signature of Sir Hugh Willoughby, with date attached, that was found on board, it was ascertained that he, at any rate, was alive towards the latter end of the month of January, 1554.

The exact locality where this lamentable catastrophe occurred is pretty accurately determined. The bay in which the ships sought shelter is situated to the westward of the island of Norkeyiff, near the Angina River, on the coast of Lapland. My authority for this is the statement made by Captain Anthony Jenkinson, of the ship *Primrose*, who visited the spot three years after the melancholy event had happened. He thus alludes to it in his diary: "*July 6th.* We passed by the place where Sir Hugh Willoughby, with all his company, perished, which is called Arzina-reca, that is to say, the River Arzina." The spot was indicated to Jenkinson by one Robert Best, who two, years before, was at the mouth of the Dwina River, when the two vessels were taken round by the Russian fishermen.

Taking everything into consideration, there can, I think, be no doubt that Sir Hugh Willoughby was the first *civilized* discoverer of Novaya Zemlya. He, however, did not land, but contented himself with sighting the coast. The discovery is alluded to in the following words:—"*August 14th.* Early in the morning we descried land, and hoisted out our boat to discover what land it might be. But the boat could not come to land, the water was so shoal; there was very much ice also, but there was no similitude of habitation. This land lieth from *Seynam** E. by N. 160 leagues,† being in 72°.‡ Then we plied to the northward, three days."

The next to sight the shores of Novaya Zemlya was Stephen Burrough, who had served as master of Chancellor's ship, the *Edward Bonaventura,* in Willoughby's expedition. In a little pinnace called the *Serchthrift,* this undaunted navigator, who afterwards became one of the four principal pilots of the Queen's Royal Navy, sailed from Ratcliff in 1556, with the avowed intention of discovering the north-east passage to China—a geographical feat that was only achieved, for the first time, last year by the Swedish exploring steamer *Vega*, under the able leadership of the gallant Nordenskjöld.

---

* Senjen, an island on the coast of Norway, near Tromsöe, and north of Lofoten. On the map of the world of 1600 it is spelt Zenam.

† The distance from Senjen to Novaya Zemlya is underrated, by 180 miles. It is about 160 leagues from the North Cape to the coast of Novaya Zemlya. But they had the current with them. This accounts for the presence of the island called Willoughby Land on the old maps. The cartographers measured 160 leagues from Senjen, and there inserted the supposed land.

‡ This latitude is quite correct.

On the 27th of July, being in sight of land, Burrough makes the following insertion in his log:—"Saw a sail. The master of her declared unto us that we were past the way which should bring us to the Ob. This land, said he, is called Nova Zembla, that is to say, the 'New Land;' and there is in it the highest mountain in the world, as he thought—but," as Burrough warily adds, "I saw it not!"

Here, then, is pretty conclusive evidence that the land had been discovered and named prior to the year 1556.

In consequence of the accumulation of ice, Burrough was unable to do more than discover the strait which separates Novaya Zemlya from Waaigat Island. Persistent head winds compelled him to return; he passed the winter at Archangel, and sailed to England the following year. The strait seen by him has subsequently borne his name, although it is not unfrequently called the Kara Strait or Gate.

Burrough has left us a very complete account of his voyage.

In May, 1580, the Muscovy Company fitted out another expedition to follow up the researches commenced by Burrough. It consisted of two small vessels, named the *George* and the *William.* The former was of forty tons burthen, and was manned by a crew of nineteen men and a boy ; the latter was only of twenty tons, and carried five men and a boy! They were commanded respectively by Arthur Pet and Charles Jackman. Pet had served in the same ship with Chancellor and Burrough in Willoughby's ill-fated expedition, and Jackman had been initiated as an ice-pilot in the *Ayde,* one of the ships in Martin Frobisher's second voyage.*

Both were reputed to be experienced mariners and fearless and energetic navigators—characters fully substantiated by their daring efforts to penetrate the Polar pack in such fragile and wretchedly equipped vessels.

The chief result of this voyage was the discovery of the strait separating Waaigat Island from the mainland, since named after its discoverer Pet Strait, but more generally known to foreigners as

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* Jackman is mentioned by Drayton in his Polyolbion :—

"Frobisher, whose fame flew all the ocean o'er,
Who to the north-west sought huge China's wealthy shore,
Then for those bounds unknown he boldly set again,
As he a sea-god were, familiar with the main.
The noble Fenton next and Jackman we prefer,
Both voyagers that were with famous Frobisher."

Jugor Strait. The two ships penetrated a short distance into the Kara Sea, but were so severely handled by the ice, which they found exceedingly heavy and tightly packed, that the idea of further exploration had to be abandoned, and the ships were steered in a homeward direction.

The nature of the ice met with in the Kara Sea appears to be, judging from my own experience in the *Isbjörn*, as heavy now as it was reported to be in those days.

Pet writes of the ice, that the pieces were so high that they were unable from the main-top to look over the hummocks, and that on the 11th of August the ships were navigated through ice, "which we thought a thing impossible; but extremity makes man do much, and in the weakness of man God's strength most appears."

The two ships parted company in a dense fog on the 22nd of August. Captain Pet, in the *George*, reached England in safety the same year, but the *William* was never seen again.

It is generally supposed that Jackman succeeded in reaching a port on the coast of Norway, where he wintered, sailing the following summer with the object of continuing his researches in the Arctic Seas. But I am inclined to think that he fetched no further to the westward than the island of Kolguev, where, I believe, he passed the winter, and that he sailed again the next winter, bent on prosecuting his explorations in a north-easterly direction.

These opinions are based chiefly on the following notes, written by one Antony Marsh, a chief factor of the Muscovy Company, and afterwards published by Purchas. The information on which the notes were based was mainly derived from Russian sources. He writes: "Heretofore your people (the English) have been at the said river of Ob's mouth with a ship, and there was made shipwracke, and your people were slaine by the Samoeds, which thought that they came to rob and subdue them." This was written about three years after Jackman was supposed to have been lost. As there were no other English ships trading and shipwrecked during that period in that particular locality, it seems only reasonable to conclude that the people here alluded to could have been no other than the crew of the unfortunate *William.*

Stephen Burrough, in the account of his journey undertaken in 1556, makes the following remarkable allusion to the loss of the *William*:—"*July* 13*th.* We went east twenty-five leagues, and saw an island north-west eight leagues, called *Dolgoieve* (Kolguev ?). Eastward there lieth a sandbank, whereupon Jackman afterwards perished." By this it would seem that Burrough did not write the account of his voyage until several years after his return to England, for it was not until 1581 that the *William* was supposed to have been lost, whereas Burrough's expedition took place twenty-five years before.*

So far but little had been accomplished by English explorers in the way of examining the coast line of Novaya Zemlya; for, with the exception of Willoughby, who is supposed to have reached as far north as Gooseland, the south-western coast only had been sighted by Burrough and Pet. Nobody had landed on its shores, and the interior was as unknown as it is almost at the present day.

The next Englishman who sighted this little-known land was Henry Hudson, that adventurous British seaman who, in 1607, had gallantly set forth, in a little cockle-shell of a vessel, with a crew consisting only of ten men and a boy, to make the voyage by sailing right across the North Pole. In the following year he fitted out an expedition to attempt a passage northwards between Spitzbergen and Novaya Zemlya. There is little doubt, from our present knowledge of what has been achieved in the Arctic Regions and what remains to be accomplished, that he selected the right direction in which to explore; but there is also no doubt that he chose the wrong time to carry out his work. Had he been a little later in the season, he would, in all probability, have scored a great success. On the 22nd of April, 1608, he sailed from the Thames, with a crew of fourteen men, of which his own son was counted as one. In the early part of June, he reached the edge of the ice in latitude 75° 29′ north. Finding it impenetrable in a northerly direction, he sailed to the eastward, and sighted the coast of Novaya Zemlya in the vicinity of Cape Britwin, in about latitude 72° 40′. He does not appear to have attempted a landing, but believing that there was no chance of penetrating what appeared to him as a solid pack, he relinquished further efforts and returned to England, arriving at Gravesend on the 26th of August.

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* Stephen Burrough was born at Northam, in Devonshire, in 1525; and died on July 12, 1586. He was one of the four principal pilots in ordinary of the Queen's Royal Navy, and conducted the fleet with the Earl of Leicester's expedition from Harwich to Flushing in 1585.

The great mistake made by these old navigators was that they were invariably too early in the season. Our recent experience goes to prove that had they remained until the months of August or September, they would have, in all probability, found a clear and navigable sea where, earlier in the year, their progress had been checked by a solid and impenetrable pack.

More than half a century elapsed from the time that Hudson set forth, on mighty deeds intent, until another English expedition was despatched for further research in the direction of Novaya Zemlya. In the year 1676 Charles II. of England was induced, through the arguments set forth by Mr. Samuel Pepys, Secretary of the Admiralty, to send out a couple of ships for the purpose of discovering the north-east passage. The vessels selected were the *Speedwell* and the *Prosperous*, and they were entrusted to the command of Captain Wood.

The enterprise, however, was not as successful as it might have been, for they did little else but sight the edge of the pack in latitude 75° 59′, as early as the 22nd of June. We may therefore consider this as having been a remarkably open season, and had Captain Wood persevered in his attempts to push north, a month or even two months later, he would, I think, have secured for himself the honour of being the discoverer of Franz Josef Land.

Like Hudson, however, he turned back at once on being stopped by the pack, knowing but little of the rapid changes that take place in the position and consistency of the ice.

From the high latitude which he attained, Wood stood over to Novaya Zemlya, where, on a reef of rocks, he was unfortunate enough to lose one of his ships—the crew escaping to the other vessel, which immediately returned to England, anchoring at the

Nore on the 3rd of August, without attempting further exploration.

With the exception of a few voyages made by yachtsmen within the last ten or fifteen years, this expedition of Wood's was the last undertaken by Englishmen in the direction of Novaya Zemlya.

Our knowledge of the country was therefore extremely limited, and we absolutely knew nothing, from our own observations, of its interior, or even whether it was inhabited or not.

Even what we know of Novaya Zemlya, in the present day, is due to the exertions of other nations, notably the Russians, Dutch, and Norwegians.

CHAPTER III.

EARLY DUTCH VOYAGES TO THE NORTH-EAST.

Oliver Brunel appears to have been the first leader of a Dutch expedition who visited the shores of Novaya Zemlya. He was born at Brussels in the first part of the sixteenth century, and probably was one of those emigrants who fled to Holland from the tyranny of the Duke of Alva.

It was whilst making a journey through the country of the Samoyeds to Siberia, that he was taken by sea along the coast to the entrance of the river Obi; thence he was piloted, we are told, by a Russian fisherman through the Kostin Shar, a channel on the south-west coast of Novaya Zemlya, separating that land from the island of Mesdusharsky.

The exact date when this expedition was undertaken is unknown, but it was certainly prior to the year 1580, and in all probability it was in 1571 or 1572.

Now, to reach the Kostin Shar from the mouth of the Obi River, Brunel must have sailed through Burrough Strait, Pet Strait, or the Matyushin Shar.

I am inclined to think that the last-named strait was the one through which he really passed, although there are no authentic proofs to substantiate such a supposition. If the Kara Sea had been clear of ice, and if this strait was known to the Samoyeds, or even to Russian fishermen and walrus-hunters—and I see no reason why it should not have been—the chances are that my surmise is a correct one; and if right, then Oliver Brunel was, without doubt, the first *civilized* European who ever sighted the northern island of Novaya Zemlya.

After the return of Pet from his rather unfortunate voyage, Oliver Brunel was again employed in the Novaya Zemlya seas, and this time in command of the first real Dutch Arctic expedition despatched from the shores of Holland. The result, however, was not encouraging to the cause of Arctic research, which was then rising into notice and popularity. Brunel attempted, but without success, to pass Pet Strait. The ice was too solidly packed, defeating all his efforts to push through, and he was eventually shipwrecked on his return voyage.

Brunel, after this disaster, feeling sure that his adopted countrymen would not for some time be in a position to assist him in making further researches, transferred his services to the King of Denmark, offering to proceed in search of the long-lost Norwegian colonies in Greenland. His offer was accepted, and he was immediately employed on work both congenial to his taste and reflecting credit on his humanity and enterprising spirit. After three vain attempts to reach the site of the old Norse settlements, he was convinced of the utter fruitlessness of his efforts, and was forced to relinquish all hopes of success. The rest of his life-history is buried in obscurity.

In the year 1594 the merchants of Amsterdam, stimulated into action by their fellow-merchants of Middelburg, fitted out an expedition to search for the north-east passage to China, by rounding the northern extreme of Novaya Zemlya.

This was considered to be, by the famous cosmographer and astronomer Plancius, an easier and a far preferable route. The idea was a bold one, and the execution of it was entrusted to a brave and skilful mariner.

The commander was Willem Barents, who had already acquired a well-earned reputation as a daring seaman, a careful scientific observer, and a successful navigator.

The expedition was not one of great magnitude, for it consisted only of the *Mercurius*, a vessel of about one hundred tons burthen, and a little fishing boat hailing from Ter Schelling, the birthplace and home of Barents.

Little is known of the family history and antecedents of Willem Barents, but it is more than probable that his father was a simple fisherman, living on the island of Ter Schelling, and that it was whilst assisting his father in his ordinary daily avocations that young Barents first acquired his love for a seaman's life of adventure.

He was a thoroughly practical sailor of experience and ability, and he possessed great knowledge of the science of navigation as practised and understood in those days.

The expedition sailed from the Texel on the 4th of June, 1594, and a month after sighted the coast of Novaya Zemlya in latitude 73° 25′, in the neighbourhood of the western entrance to the Matyushin Shar. Ten days after, they fell in with large quantities of ice. Nothing daunted, however, Barents, with dogged perseverance, continued to battle with the almost impenetrable pack by which his road was beset. On the 19th he was close to Cape Nassau, a place, even to modern navigators, difficult of approach; but with such determination and indomitable courage did he persist in pushing northwards, that on the 31st of July he actually reached the Orange Islands, situated off the northern coast of Novaya Zemlya.

Most of the names on the chart of the present day, along the west coast of Novaya Zemlya, are those given by Barents during this voyage.

On the 1st of August, in consequence of the great abundance of ice that they had to contend with, and the unwillingness displayed by the crew to proceed, the ship's head was turned in a homeward direction and the return voyage commenced.

Had Barents remained for three or four weeks longer, there is no doubt but that he would have achieved a great success; for to have reached the position he did, at so early a date, shows very conclusively that 1594 was a remarkably open year. Had he persevered, there is no saying but what he might have successfully accomplished the main object of his voyage, and thus have worn the laurels which now so deservedly adorn the brow of the gallant Nordenskjöld.

It may not be uninteresting to know that although the distance between Cape Nassau and the Orange Islands is only about one hundred miles, so great were the difficulties experienced that it took Barents three months to perform it, during which time he sailed 1546 geographical miles!

On the 16th of September, without any further event worthy of record occurring, Barents, with his two ships, anchored off Amsterdam.

The following year saw the indefatigable Barents again prosecuting his researches in the Arctic seas, in command of a vessel, one of a large and well-appointed fleet, the whole being under the command of Cornelis Nai. Nothing of importance, however, resulted from the despatch of this expedition. Barents was not only captain of the *Greyhound*, but he was also pilot major of the squadron. The vessels were well equipped, were provisioned for eighteen months, and had double complements of men. Grand results were anticipated, but the fleet was unable to get further than Waaigat Island, where the ice was massed up so heavily that "the entire channel was closed up as far as the eye could see, so that it had the appearance of a continent, which was most frightful to behold."

A bad season, much ice, and discontent and murmurings amongst the crews, convinced those in authority that success was out of the question, and on the 15th of September the ships made sail on their homeward voyage, all arriving in Holland in safety.

In consequence of the want of success of this last expedition, the States-General, after mature deliberation, decided that it would be unwise to expend the public money in any more endeavours to discover a north-east passage. But by offering a large reward for the discovery, they not only stimulated private enterprise, but gave it a considerable impetus.

Thus encouraged by the Government and supported by the earnest representations of Plancius and Barents, the merchants of Amsterdam, in a true spirit of liberality, decided upon fitting out another expedition, which was to proceed in the same direction as the two previous ones.

Two vessels, whose names or sizes are both unknown, were selected for this important service, and were placed under the respective commands of Jacob van Heemskerck and Jan Corneliszoon Rijp. Both had been employed as supercargoes in two of the ships comprising the previous expedition. Willem Barents accompanied Heemskerck as chief pilot, whilst Gerrit de Veer, the chronicler of the voyage, shipped as second mate.

The expedition sailed from Amsterdam on the 13th of May, 1596. On the 9th of June, in latitude 74° 30′, they sighted a small island, to which they gave the name of Bear Island, from the fact of their having killed a large polar bear on it.

Steering for ten days in a northerly direction from this island, land was again seen, which, though supposed to be a part of Greenland, was in reality the coast of Spitzbergen. Thence steering south, the two ships separated, on the 1st of July, in consequence of a dispute between Rijp and Barents;

the former returning to Holland the same year, after vainly endeavouring to reach a higher latitude in a north-westerly direction, whilst Barents proceeded on his adventurous voyage to the eastward, with the full determination of sailing round the north end of Novaya Zemlya, and thence to China.

Steering to the eastward, Barents made the coast of Novaya Zemlya, in latitude 73° 20′, on the 17th of July. On the following day they sailed past Admiralty Peninsula, and the day after reached Cross Island, so named by Barents from the fact of finding two large crosses erected on the island when discovered by him.

These symbols of Christianity, erected in an almost unknown and totally uninhabited country, are direct evidences that the island had not only been discovered by previous navigators, but that it had also been visited—when, and by whom, will always remain a mystery.

Steadily pressing onwards, almost in the same track as that to which he had adhered two years before, Barents succeeded in rounding the extreme north point of Novaya Zemlya, and sailing down a short distance along its east coast, he was able, on the 26th of August, after surmounting many difficulties, to secure his vessel in a bay now known as Barents Ice Haven, where he and his companions were "forced, in great cold, poverty, miserie, and griefe, to stay all that winter."

Before finally being frozen up for the winter, these brave Dutchmen passed many an anxious and weary hour, holding, as it were, their lives in their hands, at almost every minute of the day. We read, on the 27th of August, that the ice pressed on the ship with such force that she was lifted up four feet, and "it seemed as if the keele lay on the ground, so that it seemed that the ship would be overthrowne in the place." The following day they were released from their perilous position by the ice suddenly opening, "with such a noyse and so great a crack, that they thought verily that they were all cast away, knowing not how to save themselves."

On the 30th of August the ice again closed in upon them, with greater force than ever, driven by a strong southerly gale. It is difficult to realize the extreme danger to which these brave men were exposed, but a faint idea may be gathered of their position by reading the following account in Gerrit de Veer's narrative:—"The ice began to drive together one upon the other with greater force than before, and bare against the ship w^{h} a boystrous south-west wind and a great snowe, so that all the whole ship was borne up and inclosed, whereby all that was both about and in it began to crack, so that it seemed to burst in a 100 peeces, which was most fearfull both to see and heare, and made all ye haire of our heads to rise upright with feare;

and after y^{t}, the ship (by the ice on both sides that joined and got under the same) was drived so upright, in such sort as if it had bin lifted up with a wrench or vice."

On the 11th of September these gallant fellows, numbering in all only seventeen souls, seeing there was no prospect of release before the ensuing summer, decided upon building a house in which to pass the winter (the ship itself being deemed too precarious a habitation), in which they could reside devoid of all fear and anxiety.

With driftwood, which lined the beach in great quantities, and with planks obtained from their vessel, then rendered almost unseaworthy from the pressure of the ice to which she had been exposed, they constructed a hut in which they passed ten long and gruesome months.

It is probable that they were, in a measure, prepared for passing a winter in the Arctic seas, for we are told that before leaving Holland they shipped "as many unmarryed men as they could, that they might not be disswaded, by means of their wives and children, to leave off the voyage."

Their exemplary conduct during the long monotonous winter is beyond all praise, exposed as they were to intense cold and great privations regarding food. We are told that the cold was so great that "a man could hardly draw his breath," and that they "could hardly thrust their heads out of the dore." Yet during all this time the most perfect discipline was maintained without any undue exercise of authority. To increase their sufferings, they were attacked by scurvy, to which dreadful disease no less than five out of their little band succumbed.

They made their house as comfortable as circumstances would admit; bed-places were constructed along one side, a large wine-barrel was ingeniously converted into a bath, and another large cask was fixed on the centre of the roof to act as a chimney.

The winter was a cheerless one, but, in spite of cold and meagre fare, it passed happily and, I am almost tempted to say, pleasantly—a circumstance that is due to the unanimity and good feeling that prevailed amongst them all.

On Twelfth Night, which is always regarded and kept as a festival in Holland, the old home festivities and associations were not neglected; for we read that, on the eve of that day, "we prayed our maister that we might be merry that night, and said that we were content to spend some of the wine that night which we had spared, and which was our share every second day, and whereof for certaine daies we had not drunke; and so that night we made merry and drunke to the three kings.

And therewith we had two pound of meale (which we had taken to make paste for the cartridges), whereof we made pancakes with oyle, and we laid to every man a white (wheaten ?) bisket, which we sopt in the wine. And so, supposing that we were in our owne country and amongst our frends, it comforted us as well as if we had made a great banket in our owne house. And we also distributed tickets, and our gunner was king of Nova Zembla."

On January 24th the sun returned, but with the dawning light came also the conviction that their ship was no longer seaworthy, and that other means for delivery must be thought of, in order to avoid the miseries and horrors of a second winter.

The only chance of salvation that presented itself was the very poor one of escape by boats. But where were the boats to come from ? The difficulty was speedily overcome. These resolute men set to work, and with the driftwood and planks from the ship at their disposal, they succeeded in building a couple of clumsy, though strong, boats, in which they embarked on the 13th of June, 1597, and quitted the scene of their sufferings.

Barents, at this time, was so weakened and exhausted by disease that he was quite unable to walk ; he and the other sick men were therefore carried down to the boats, and gently and tenderly placed in the stern sheets. In spite of the prostrating nature of his illness, he appears, up to the last moment, to have issued his orders as leader, giving the necessary instructions regarding the amount and quality of the provisions to be embarked.

They were not, however, overburdened with many luxuries, having scarcely sufficient food to preserve life, except on those rare occasions when they had the good fortune to kill a bear, and to enjoy the delicious morsels to be obtained from it!

One short week after their departure from winter quarters, they lost the man to whom they had hitherto looked up as their guide and leader. Willem Barents, their brave commander, was removed from them by death, finding a grave, like many other daring navigators, in the midst of his discoveries. This sad, though not unlooked-for event, is alluded to in the following words by Gerrit de Veer :—" The death of Willem Barents put us in no smal discomfort, as being the chiefe guide and only pilot, on whom we reposed ourselves next under God."

After undergoing great hardships and privations, and encountering innumerable adventures and hair-breadth escapes, the remnant of this little band, much reduced by sickness, succeeded, by sailing down along the west coast of Novaya Zemlya, in reaching a harbour in Lapland, where, by a curious coincidence, they were rescued and taken to Holland by Jan Corneliszoon Rijp, the same man who had commanded their consort the previous year, and who separated from them at Bear Island.

Their hearty reception in Holland was well deserved by the gallant fellows, who had faced so many dangers in their attempts to solve one of the greatest geographical problems of that, or even the present, age. We hear that they were entertained at a great banquet, more sumptuous than the modest one to which they sat down on Twelfth Night, and afterwards they had the honour of recounting their adventurous tale to the Prince of Orange.

A careful perusal of the chronicle of this voyage shows that the condition and locality of the ice has undergone but little change during the last three hundred years. It is as difficult now as it was in 1596 to round the northern extreme of Novaya Zemlya during the months of July and August. At that time the ice is invariably packed close along the shore from Cape Nassau northwards, although there have been exceptional years when vessels have sailed along that coast without being impeded by the heavy masses of ice usually seen. A different tale, however, is told in the month of September. Then, as a rule, the sea is clear, and vessels would have little or no difficulty in reaching the Orange Islands, the great and only drawback at that late season of the year being the gradual shortening of the days, and the corresponding lengthening of the nights.

Of course, there are, occasionally, unfavourable years when, no matter how early or how late in the season, navigation along the coast of Novaya Zemlya is rendered quite impossible by the densely packed masses of ice which accumulate along its shores.

The Dutch were not to be disheartened by the unsuccessful result of Barents' expedition. Although no others, on a large scale, were despatched, the coast of Novaya Zemlya was visited by some experienced navigators from Holland whilst engaged in the pursuit of whales.* Foremost amongst these worthies were Theunis Ys and William de Vlamingh.

The former gives some very interesting and important data regarding the disruption of the ice along the western shore of Novaya Zemlya. He was under the impression that *sometimes* it would not be difficult to sail round the north end of the island and thence reach the coast of Tartary, but he thought it would not be possible to go further to the eastward on account of the thick fogs so prevalent during the navigable season.

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* In 1609, according to Witsen, attempts were made to perform the voyage to China and India, by following in the footsteps of Barents, and sailing round the north extreme of Novaya Zemlya. In consequence of the cold and ice, these attempts all ended in complete failure.

In 1612 Captain Jan Cornelis van Hoorn made another attempt. After sighting Novaya Zemlya, he coasted to the northward until the 8th of July, when his further progress was arrested by ice. Steering to the north-west, he succeeded in reaching the latitude of 76° N., when he again steered in for the land, which he reached on the 20th. Working his way northward and westward through loose ice, he succeeded in reaching, on the 18th of August, the high latitude of 77° 30′, when, being unable to proceed any further, he returned home. This voyage fully bears out subsequent observations that have been made regarding the position of the ice during the month of August in the Barents Sea.

William de Vlamingh actually sailed round the northern extreme of Novaya Zemlya in 1664, and passed close to the winter quarters of Barents, but failed to see the house. He lays claim to having sailed in a north-westerly direction from Novaya Zemlya, as far as 82° north latitude. I think there must have been some error in his observations, for had he sailed as far north as the position named, it is hardly possible that he would have escaped seeing Franz Josef Land! He reports that, as he went north, the water became more smooth and he experienced less current. (He must have been in the vicinity either of land or ice.) He states that he saw *no ice* round Novaya Zemlya, and none towards the Pole, only an occasional floe here and there. In his highest latitude, supposed to be about 82° 10′, he obtained soundings in seven and five fathoms, but saw no land.

There is no satisfactory authority for the correctness of this navigator's observations for latitude, and still less for Witsen's story of Cornelis Roule's voyage. This Dutchman declared that he had sailed as far north as 84° 30′ or 85° in the longitude of Novaya Zemlya. In this latitude Roule stated that he went on shore in his boat, and ascended a high hill, whence he observed an extensive sea, in which he thought he could have sailed in a northerly direction for three days more. Either the hill must have been marvellously high, his eyesight uncommonly good, or else his ship an excessively dull sailer, to have justified him in making such a statement.*

This was the last of the old Dutch exploring voyages towards Novaya Zemlya of which we have any authentic information, and no reliance can be placed in the accuracy of the observations for latitude of the two last navigators.

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* See "Noord en Oost Tartarye, door Nicolas Witsen," p. 920.

CHAPTER IV.

RUSSIAN DISCOVERIES IN NOVAYA ZEMLYA.

SCARCELY ten years had elapsed from the death of Peter the Great, before the Empress Anna Ivanovena, in the interests of geography and commerce, undertook to send out various expeditions in the direction of Novaya Zemlya, the destination of the majority of them being the Obi River.

Little is known of the result of these expeditions, which were despatched between the years 1734 and 1739; but few, if any, actually reached Novaya Zemlya.

Shortly after this period, rumours appear to have been circulated that the mountains on the two islands, constituting what is generally known as Novaya Zemlya, contained large quantities of silver ore. In consequence of this report, a rich merchant of the town of Archangel, in the White Sea, in 1757, fitted out a vessel in order to procure a cargo of the precious metal. His sudden death before the departure of the ship prevented her sailing.

Three years afterwards, another Russian, named Sawwa Loschkin, from Olonetz, determined to explore the east coast of the island. Although few of the details are known, it is pretty clearly proved that this expedition sailed through Burrough Strait into the Kara Sea, and successfully circumnavigated both islands, rounding Cape Mauritius and sailing back along the west coast, and so into the White Sea. The difficulties encountered during the voyage must have been enormous, for we are told that Loschkin was occupied no less than three summers in sailing from the Burrough Strait to Cape Mauritius, the northern extreme of Novaya Zemlya! He must therefore have spent, at least, two winters in the Kara Sea!

It is much to be deplored that there is no detailed account of this voyage in existence; for the information that would certainly be derived from such a record would be very interesting. All that we know is that Loschkin reported the east coast to be less hilly, and more devoid of harbours or secure anchorages than the more rocky west coast. He found driftwood lying along the shore in great abundance.

In 1768 Lieutenant Rosmyssloff, formerly belonging to the Russian Imperial Marine, undertook the double mission, as it were, of exploring Novaya Zemlya, and, in the interest of an Archangel merchant, of searching for silver ore. He sailed from Archangel in a small three-masted vessel, with a crew of thirteen men, on the 10th of July.

On August 3rd he reached Gooseland; thence proceeding northwards, and making a complete examination of the coast as he sailed along. He reached Cape Britwin on the 9th, and anchored for a few days before going into Nameless Bay, where, in all probability, his people provided themselves with a large supply of fresh provisions in the shape of "looms," the bay being one vast loomery, swarming with countless myriads of these birds.

On the 14th of August the Matyushin Shar was reached; but they only sailed seven miles into it, before anchoring, their pilot Tjirikina refusing to take the ship any further.

The Matyushin Shar is a narrow channel, in some places not a mile in breadth and about sixty miles long, which separates the two islands in an east and west direction.

This remarkable strait is bounded on either side by high hills, towering to a height of from three to four thousand feet, and terminating, in many places, with steep and precipitous cliffs rising abruptly out of the sea. The channel is very deep, varying from forty to as much as ninety fathoms in depth in the centre; but small vessels may find good anchorages close in to the land in comparatively shallow water.

I have not been able to determine satisfactorily when, or by whom, this strait was first discovered and named.

In most charts and writings it is invariably alluded to as "Matotchskin Schar," and this word is, doubtless, a corruption of Matyuska, which is the diminutive of the Russian name Matoei, or Mathew. Marsh calls it the "Mattuschan Yar," whilst according to Dr. Hamel, who must be regarded as a good authority, Matotchskin Schar is a corruption of Matyushin Shar, which I have therefore adopted as being the correct form. Marsh, writing in 1584, called the north island "Mathewe's Land," from which we may infer that it had been seen by the same individual after whom the strait was named. But who Mr. Mathew was, or when he flourished, are matters of some doubt.

To return to Lieutenant Rosmyssloff. This officer, in no way disheartened by the refusal of his pilot to carry the ship through the Matyushin Shar, at once commenced his work of exploration in a small boat; and with such good results as, apparently, to overcome the objections of the pilot, for the ship was carried in safety through the strait and established in winter quarters near the eastern entrance.

On the 1st of August, from a high hill, he had an extensive view of the Kara Sea, which appeared free from ice; but he considered his vessel too frail to run the risk of attempting to push northwards.

Being provided with a wooden house, which had been put on board the ship in pieces, he caused it to be erected. But the house not being large enough to accommodate the whole party, he pulled down a small hut which he there found, and which had probably been built by some walrus-hunters, and transporting the material to his winter quarters, constructed a second house, dividing his party between the two.

Before the end of September, and almost before they were properly housed, winter was upon them; and by the 1st of October the Matyushin Shar was frozen over. Five days later, the Kara Sea was covered with ice.

The sun disappeared on the 5th of November, not to shine upon them again until the 4th of February! The winter was a hard one, and Rosmyssloff and his companions suffered greatly from the confined space and want of fresh air in their wretchedly constructed and ill-adapted huts. To add to their misery, sickness broke out in the small band, completely prostrating the pilot and two other seamen.

Shortly after the reappearance of the sun, a herd of reindeer was observed, and one of the men was immediately despatched in pursuit. We can imagine the anxiety of all who were left behind to obtain information regarding the result of the chase, praying earnestly that their comrade's prowess might be rewarded with success; for fresh meat, they were aware, was necessary to restore their impaired healths. Alas! the poor hunter, who set out so full of zeal and vigour, never returned! It is true he succeeded in shooting several of the herd, but before he could return, he was overtaken by a heavy snowstorm, in which he lost his way, and was buried alive in a snow-drift!

Towards the end of June, the strait was so full of ice that Rosmyssloff determined to finish his survey of the south side of the channel over the ice. This was successfully carried out, and a very complete examination made of the southern coast. In addition to his hydrographical work, he made very extensive and valuable observations on the fauna, flora, and geology of the country, and appears to have been altogether a most efficient traveller. To him, also, is due the credit of having been the first person to determine accurately the length and breadth of the Matyushin Shar.

He reported the country to be of a slaty limestone formation, containing no precious metals. Among the hills he saw many fresh-water lakes, abounding with numberless small fishes. These ponds are still in existence, containing fish varying in size from two inches in length to from twelve to fourteen pounds in weight.[*]

The channel was not free of ice until the first week in August, but the damaged condition of his ship, and the weak and sickly state of his crew, prevented Rosmyssloff from carrying his explorations into a higher latitude. He had barely entered the Kara Sea, when his vessel was so severely injured by a heavy piece of ice that he was compelled to return in order to render her seaworthy. Whilst patching up his ship, he was luckily fallen in with by a Russian fishing vessel, which conveyed the lieutenant and his men to Archangel, arriving there on the 8th of September.

For nearly forty years after the return of this expedition the shores of Novaya Zemlya were unvisited, except by those engaged in the pursuit and capture of walruses and other oil-yielding animals, of whose proceedings no record has been handed down.

In 1807, however, Count Rumanzoff equipped an expedition, entirely at his own expense, for the purpose of making an examination of the country with a view to its mineral products. Pospeloff, an ex-lieutenant in the Russian Navy, was entrusted with the command of the expedition, whilst Ludlow, who held a high official position in the management of the Ural mines, was sent to examine the country for silver ore. The crew of the ship consisted of a pilot and eight sailors, whilst eight miners were also embarked to carry out the chief object of the expedition. The vessel was not a large one, being only thirty-five tons burthen.

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[*] Sir Henry Gore-Booth caught several char in these ponds, and I brought home an adult and several young specimens of the char (*Salmo alpinus*). The adult was nearly three feet long. The Novaya Zemlya char is one of the finest specimens of the genus. As compared with those from Lapland and Iceland, the Novaya Zemlya kind has a somewhat shorter pectoral and a rather lower dorsal fin.

They sailed on the 9th of July, 1807, reaching the neighbourhood of the Kostin Shar on the 28th, where a very complete examination was made by Ludlow and his assistants for minerals, but without success.

On the 11th of August they reached the Matyushin Shar, and anchored in a good harbour on the north side of the entrance to the strait, which received the name of Silver Bay—so called on account of the quantity of talc which they saw mingled with the slate, and which caused a metallic glittering, similar to the sheen that would be produced by the more precious mineral. Here they made a diligent and extensive search for ore, but without success.

Pospeloff was unable, for lack of competent assistance, to do much towards the cartography of

SILVER BAY, WEST COAST NOVAYA ZEMLYA.

Novaya Zemlya, but he projected a very serviceable sketch chart of the western coast of the south island. The expedition returned to Russia after an absence of about three months.

Twelve years afterwards, the Russian Government despatched a vessel, named the *Novaya Zemlya*, for the purpose of exploring and surveying the east coast. The command of it was conferred on Lieutenant Lasareff, who was ordered to make the necessary preparations for wintering. Bad luck seems to have attended this expedition throughout.

They left Archangel on the 10th of June, and attempted to reach the Matyushin Shar, but being stopped by heavy streams of ice, they steered to the southward with the object of entering the Kara Sea through Burrough Strait. But here again their progress was impeded by ice. After striving for some days, but in vain, to push through, Lasareff made another attempt to go north; but, scurvy breaking out among his men, he was obliged to relinquish the enterprise, and return to Archangel without having accomplished anything of importance.

Undeterred by the failure of this expedition, the Russian Government, in 1821, with praiseworthy zeal, sent out another vessel, bearing the same name. She was of two hundred tons burthen, and was built and strengthened expressly for ice navigation. Lieutenant Lutke, a very able and accomplished officer, was appointed to the command. His instructions were—to examine the coasts of Novaya Zemlya, to determine the positions of the loftiest and most conspicuous mountains, and, above all, to ascertain accurately the length and breadth of the Matyushin Shar. His crew consisted of two officers, a doctor, pilot, and thirty-nine men.

This was the best equipped and most important expedition that had ever been despatched for the exploration of Novaya Zemlya.

For four consecutive summers, namely those from 1821 to 1824, was Lutke employed in surveying the west coast, returning to Russia each year on the approach of winter. During this period, although the seasons appear to have been anything but favourable, he did good and important work. His coast line, as laid down on the charts of the present day, is very accurately delineated, and I was myself able, during our cruise in the *Isbjörn*, to verify a great many of the positions as determined by this excellent and painstaking navigator more than fifty years ago. In fact, his survey of the western coast is the only reliable one in existence. Unfortunately the ice, on all occasions, offered an effectual barrier to his advancing beyond Cape Nassau, and his observations therefore extend no further in a northerly direction than the Pankratjeff Islands.

But it must be observed that Lutke never persevered in his efforts to reach a high latitude, or in his endeavours to sail round the northern extreme of Novaya Zemlya, after the end of July, or, at the very latest, the beginning of August, believing that it was imprudent at such a late season of the year to continue his researches in a northerly direction. If he had waited until the end of August or the early part of September, he would, in all probability, have found a clear and unencumbered sea, and would have experienced little or no difficulty in circumnavigating the island, thus executing the work entrusted to him more thoroughly and completely.

It is a significant fact that, during the last three hundred years, with only very few exceptions, the edge of the ice between Spitzbergen and Novaya Zemlya has invariably been found by navigators almost in the same locality at the same time of the year. It is well known to all those who have had any experience in ice navigation how very erratic are the movements of a pack, and what a marvellous difference the lapse of a few days will make in the position, and even consistency, of ice. It is, then, reasonable for us to suppose that had the various expeditions which have been despatched for the purpose of exploring the coast of Novaya Zemlya, continued their exploration during the latter end of August or beginning of September, the circumnavigation of the islands would more frequently have been achieved, and other successful results accomplished.

During the early part of the season—that is to say, in the month of June—a great deal of ice is to be found off the south-western coast, extending from North Goose Cape to the southern extreme of Novaya Zemlya. This ice was met by Lutke as late as July, extending so far off the land that it was impossible for him to get on shore. To the northward open water is invariably to be found, and I attribute the presence of this ice to its having been formed to the southward, in the large bay bounded to the westward and the eastward by Kolguev Island and Waaigat Island respectively, and that it therefore never has any connection with the real pack ice of the Barents Sea. We, in 1879, found these loose ice streams in the month of June exactly in the same position as described by Lutke and others, but we had no difficulty in sailing through them to the northward, and in emerging into a clear and open sea.

Although one of the most important clauses in the orders given to Lutke was the examination of the Matyushin Shar, he was unable, during the first year, to find the entrance to the strait, although he passed it on two or three occasions. Thick weather, and the great similarity of the land on either side of the channel, must be the excuse for his inability to determine his exact position and thereby discover the entrance. Lutke was able to verify some of the positions as laid down by Barents in the sixteenth century, besides doing otherwise good and important service.

The next contributions to our knowledge of Novaya Zemlya are due to Russian private expeditions sent out between the years 1832 and 1836. The main object was the very laudable one of endeavouring to re-establish the trade, which had completely died out, between the White Sea and the mouth of the river Obi. The promoters of the enterprise were Brandt, a merchant of Archangel, and the forest overseer Klokoff. Being interested in science, these gentlemen were also desirous of combining the exploration of the east coast of Novaya Zemlya with their trading transactions.

Lieutenant Pachtussoff, of the Imperial Navy, was selected for the command of the expedition. This officer appears to have had some experience in ice navigation, and was in some way or other intimately connected with the Russian walrus-hunters who sailed annually to seek their prey along the coasts of Novaya Zemlya and Spitzbergen. He was convinced that the flat-bottomed, undecked boats of these walrus-hunters, called *karbasses*, were better suited for the enterprise on which he was about to be employed, than a vessel of ordinary construction. He therefore caused one to be built, according to his plans, based, in a measure, on the model of a *karbasse.* She was of no great size, being only forty-two feet in length, fourteen feet broad, with a depth of six feet—little larger than the ordinary service launches supplied to the ships of her Majesty's Navy at the present time.

In spite of her small size, she was fitted with cabins at either end. She carried two officers besides her commander, and her crew consisted of seven peasants! Why sailors were not entered is not stated, but these peasants may probably have been fishermen or walrus-hunters. She, also, was named the *Novaya Zemlya.*

Pachtussoff was directed to work his way into the Kara Sea through Burrough Strait, and then to survey the east coast of Novaya Zemlya. In order to make the exploration more thorough, two other small vessels were fitted out at Archangel, and placed under the respective commands of Lieutenant Krotoff and the pilot Gwosdareff, with instructions to proceed along the west coast, meeting Pachtussoff, if possible, in the Matyushin Shar, and afterwards to co-operate with him, so that, through their joint efforts, a complete survey of the entire coast of the southern island would be made.

The little squadron put to sea during the early part of August, 1832, and ten days after Pachtussoff sighted the southern coast of Novaya Zemlya, to the eastward of the Kostin Shar.

After many vain attempts to push through Burrough Strait, he succeeded in getting his vessel into Kamenka Bay, at what might be termed the eastern entrance to the strait. Here he determined to winter—a decision mainly formed on account of the lateness of the season, and the immense quantities of driftwood which they observed along the beach. On shore they found a half-ruined hut, and a cross which had been erected by Loschkin in 1760, during his remarkable voyage round the island.

The winter passed cheerfully, due, in a great measure, to the exertions of Pachtussoff, who preserved the health and spirits of his men by keeping them constantly employed and in good humour.

On the 19th of January the sun returned, after an absence of sixty-five days, and in April they were able to continue their examination of the coast by means of sledges. Towards the end of June, a strong south wind broke up the ice, and shortly after Pachtussoff started in a small boat, with only two men and a month's provisions, to explore the east coast and reach, if possible, the Matyushin Shar. It was a bold and adventurous journey, bravely planned and gallantly attempted. He found, however, the ice so densely packed, that he was unable to reach a higher position than latitude 71° 38′ 19″, when, his provisions failing, he was forced to give up the attempt. Returning to their winter quarters, he found his vessel afloat and ready for sea. Without losing time, he immediately decided upon pushing on.

On the 31st of July he sailed into a large bay, which he named after his countryman and fellow-explorer, Lutke. The cairns and crosses which Pachtussoff erected on both sides of this bay were standing when we visited the place in the *Isbjörn* a few months ago. On one of the latter some Russian characters were engraved, with the date 1833. We found the stones composing the cairns to be covered with lichen—a fact which certainly confutes the idea, at one time entertained, that for these cairns to have lichen adhering they must be of considerable age. The one we saw in Lutke Bay was completely covered, yet we know it had only been constructed forty-six years.

During the Arctic expedition of 1875, some cairns were found on Washington Irving Island, in Smith Sound, which, in consequence of the lichen, were estimated to have been erected a very long time ago. I am now of opinion that they must have been built by Dr. Hayes, or some of his sledge party, when they passed the island in 1861, although no mention is made of the circumstance in the work published by that traveller on his return to America.

But to return to Pachtussoff. Continuing his course in a northerly direction after leaving Lutke Bay, he reached and named Schubert Bay on the 22nd of August, and subsequently two more bays, to which he gave the names of Brandt and Klokoff respectively, after the originators and chief supporters of the enterprise. On the following day they entered the Matyushin Shar. The Kara Sea at that time appeared so free from ice, that they thought they would have no difficulty in proceeding still further to the northward; but they were unwilling to run the risk of being detained for a second winter, for which, they were aware, they had neither provisions, nor the strength to endure. On the 27th of August they sailed through the Matyushin Shar, but without finding any traces of either Krotoff or Gwosdareff, whom they expected to find somewhere in the neighbourhood of the strait.

Sailing homewards, Pachtussoff reached Kolguev Island on the 5th of September, his vessel in such a sadly crippled condition from her numerous encounters with the ice, that he had to abandon his intention of taking her to Archangel, and ran for the Petchora instead. Here he left his shattered craft, and travelled by reindeer sledges to Archangel, which he reached on the 10th of December.

On his arrival he heard that Gwosdareff had already returned, but of his colleague there were no tidings.

During this cruise, the *Novaya Zemlya* lost three men out of her small ship's company by sickness, two of whom died in winter quarters.

Great anxiety was naturally felt at the protracted absence of Krotoff. In the following summer the Russian Government fitted out two small vessels—one a schooner, the other a *karbasse*—whose united crews only numbered seventeen men, to go in search of the missing ship, and also with instructions to explore the east and west coasts, north of the Matyushin Shar. The schooner was placed under the command of Pachtussoff, whilst the *karbasse* was commanded by the pilot Ziwolka. Both vessels were prepared to winter.

On the 3rd of August they sailed from Archangel, and reached the Matyushin Shar in the early part of September. On the 25th the ships went into winter quarters in a small harbour on the north side of the strait. Previous to this they had met a walrus-hunter, who had told them that to the northward of the Matyushin Shar a great quantity of wreckage had been seen, which, from the description, was supposed to be that of Krotoff's ship.

The winter being passed, the indefatigable Pachtussoff organized sledge parties, with which he completed a very accurate survey of the Matyushin Shar, his observations agreeing very nearly with those previously made by Rosmyssloff.

This work finished, he returned to his winter quarters, where he began to build a small vessel in which to sail round the north end of Novaya Zemlya. His reason for not going in his own ship was that he deemed it prudent to leave her behind as a depôt, in case of any accident befalling the one in which he purposed to carry out his work of exploration. It was a plucky resolve.

Ziwolka had, in the mean time, by means of sledges, reached as far as Cape Flotoff, on the east side of the island, north of the Matyushin Shar. His supply of provisions beginning to fail, he was compelled to return. He rejoined his ship after an absence of thirty-four days. At his furthest northern point he erected a large cross, formed out of some of the driftwood with which the shores of Novaya Zemlya abound, on which was inscribed the date of his visit, "April 24, 1835."

On July 9th the Matyushin Shar was clear of ice, and on the following day Pachtussoff, accompanied by Ziwolka, sailed out of the strait and up the west coast in the little vessel he had constructed for the purpose. He took with him two smaller boats, and provisions to last for three and a half months. At his winter quarters he left a couple of invalids, with two men to tend them. On approaching Silver Bay, they found the remains of a shipwrecked vessel, which they concluded was the one that had belonged to the unfortunate Krotoff, who, with his men, must have perished the preceding year.

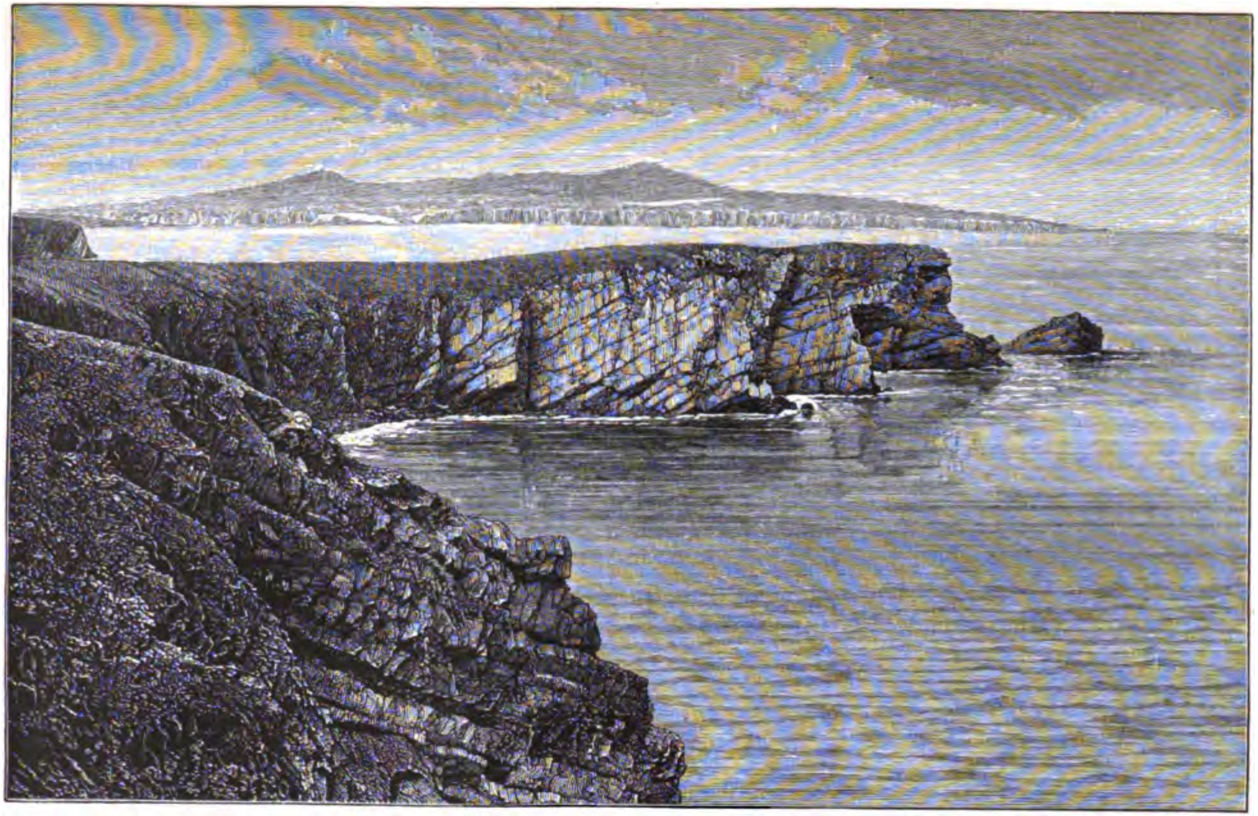
On the 18th of July they passed Admiralty Peninsula, where they met a good deal of loose driving ice. On the next day they reached Willem and Berg Islands, where also they encountered much ice.

In attempting to pass between these two islands, the pack closed round them, and eventually destroyed their frail little bark. The possibility of such an accident had not been overlooked by Pachtussoff; and arrangements had been made to secure the safety of the small boats and provisions.

Whilst in this unpleasant and rather critical position, a vessel engaged in the capture of walruses hove in sight, rescued them, and ultimately carried them back to their own ship in the Matyushin Shar, which they reached on the 19th of August.

Being dissatisfied with the small amount of work which he thought he had accomplished, the indefatigable Pachtussoff at once commenced arrangements for continuing the exploration of the east coast in a small *lodia*—that is, a little Russian fishing vessel—which he happened to fall in with in the strait.

Starting away with only five men, on the day after his arrival on board his own ship, he sailed



WEST ENTRANCE TO MATYUSHIN SHAR.

through the Matyushin Shar, and working his way with great difficulty through loose strips of ice, reached the island that now bears his name, about twenty miles further north than the position reached by his subordinate Ziwolka during the early part of the summer. About forty miles further north he saw high land, to which he gave the name of Daljnynoss. The ice was so packed that he was unable to penetrate it any further in a northerly direction.

On the 8th of September this energetic navigator returned to the Matyushin Shar, where he found his ship ready for sea, Ziwolka having been busily occupied in preparing her during his absence. Five days afterwards, they took their departure for Russia. The expedition was absent altogether 440 days, during which time two of the crew had died.

The gallant Pachtussoff, after his arrival in Russia, attempted to get his papers and maps into something like order, but his health failed. He never spared himself during the cruise, and he had, in consequence, suffered much from the hardships and privations which he had necessarily endured; in addition to which, fever had attacked him after the loss of the *karbasse*, which he had been unable to shake off. He died of nervous fever on November 7th, in the midst of his work, shortly after his arrival at Archangel. By his death Russia was deprived of the services of a gallant, zealous, and talented officer; his energy and the work which he performed whilst exploring in Novaya Zemlya stands out conspicuously amongst that of many other brave and energetic explorers who were, at different times, employed in the same field.

To Ziwolka was allotted the task of working up the observations of Pachtussoff, which were completed and taken to St. Petersburg in 1836.

In 1837 Baer, a distinguished naturalist, sailed to make scientific observations in Novaya Zemlya. This expedition, however, traversed no new ground, and added but little to our geographical knowledge of the country, but its natural history results were of the highest importance and interest.

The expedition was fitted out under the direct supervision of the Russian Government, and Ziwolka was appointed to the command of the vessel, Baer being the real scientific head. The ship selected had been already equipped when Baer made his appearance at Archangel. On going on board, he found that the only accommodation the vessel afforded had been appropriated by Ziwolka, and that there was not even sufficient space in the ship to stow away the collections he hoped to make. Under these circumstances he wrote to the Government, representing the state of affairs, when, after a little trouble, the difficulty was overcome by the hire of a walrus ship in addition!

They sailed in June, and in the following month reached the western entrance of the Matyushin Shar. They were unable to pass through the strait on account of ice, but the west coast was entirely clear. They remained for some days at anchor, during which time very extensive botanical and zoological collections were made. After a time they succeeded in penetrating the strait, and found the remains of Rossmyssloff's huts. The Kara Sea, being full of ice, offered a bar to their further advance in that direction; so, returning through the Matyushin Shar, they proceeded to the southward along the west coast, making many excursions as they went along.

In the Kostin Shar they encountered a terrible storm, which lasted nine days; the sea was so high that the waves actually broke over the decks of their ships. They were for some time in great anxiety regarding a hunting expedition which had been sent out, and which was absent when the gale burst upon them. Nothing was heard of them for some days after the storm had subsided, but when the last faint spark of hope had nearly been extinguished, they returned, bringing with them the skins of a couple of reindeer. A votive cross had, in the mean time, been erected to their memories, according to Novaya Zemlya custom.

They returned to Archangel in September. In a scientific point of view this cruise was eminently successful, Baer having collected no less than ninety distinct species of phanerogamic plants, and about half as many cryptogams. He also brought home about seventy different kinds of invertebratæ.* Ziwolka was in charge of the meteorological and magnetic observations; besides which, he determined the heights of several of the principal mountains in the Matyushin Shar.

In the following year, 1838, the Russian Government despatched another expedition for the purpose of completing the observations along both east and west coasts. It consisted of two small schooners, the *Novaya Zemlya* and the *Spitzbergen*, which were expressly built for the work. The command of the first-named vessel was entrusted to our old friend Ziwolka, whilst Lieutenant Moissejeff commanded the other. The crews of both ships amounted to twenty-four men. A house, for wintering in, was put on board in pieces, and they were instructed to sail, if practicable, round the north extreme of Novaya Zemlya and down the east coast, then through the Matyushin Shar, wintering if possible in Cross Bay. On the 7th of July they sailed from Archangel, accompanied by a *lodia,* in which was placed their house and other stores.

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* Professor von Baer was born in Esthonia in 1792, and went to reside at St. Petersburg in 1834. His labours in Novaya Zemlya led to his being made a corresponding member of our Geographical Society in 1843. From 1851 to 1856 he was employed investigating the fisheries of the Volga and Caspian, and his great work on this subject was published at St. Petersburg in 1859. He did great service to geographical literature, and discovered what is known as Baer's Law (the tendency of rivers gradually to swerve from a direct course), besides editing a series of volumes on Russian geography. Professor Baer died on November 28, 1876.

Leaving directions with Moissejeff to erect the house and get everything in readiness for passing the winter in Cross Bay, Ziwolka pushed onwards with the hope of being able to accomplish the chief part of his orders and sail round the north end of Novaya Zemlya. But he was seized with illness and compelled to return. Both ships passed the winter in Cross Bay, and, from all accounts, suffered fearfully from sickness and intense cold. Their leader, Ziwolka, died on the 26th of March. On the 16th of the following month, Moissejeff attempted to make explorations in the neighbourhood of their winter quarters, with the assistance of dogs and sledges; but he and his party suffered so terribly from cold and snow-blindness that they were forced to return, after an absence only of forty-eight hours.

On the 21st he made another attempt, but the exhausted condition of his men necessitated his return in a week's time.

In Moissejeff's journal we find the following entry on the 17th of May:—"We have lost eight men; eleven men are ill, and only five in good health, and the latter are very weak." This was, it must be admitted, a very deplorable state of affairs, yet it does not appear to have been sufficiently bad to subdue the spirits of the gallant little party.

The ships were released from the ice, in which they had been imprisoned for nearly ten months, on the 2nd of July, when Moissejeff, despatching one to the southward, sailed in the other the following day to the northward. Communicating with some walrus-hunters off Admiralty Peninsula, he was informed that an impenetrable pack existed to the north; so, relinquishing all hope of executing his mission, he returned to Archangel.

Moissejeff, like other enthusiastic Arctic explorers, attributed the great mortality and sickness of his men, not so much to the severity of the climate, as to their original delicacy of constitution.

This ends the work of exploration carried out in Novaya Zemlya by the Russian nation, although hunters from that country annually visit its shores, bent on the pursuit and capture of walruses, seals, white whales, and salmon.

CHAPTER V.

NORWEGIAN EXPLORERS IN NOVAYA ZEMLYA. THE ROSENTHAL VOYAGES AND ENGLISH YACHTSMEN.

ALTHOUGH the researches of Norwegian navigators in the Novaya Zemlya seas are of comparatively modern date, they are, nevertheless, of great importance when taken in conjunction with the work performed in the same waters by other explorers of different nationalities.

The hardy Norse fishermen have long frequented the Arctic seas in the prosecution of their trade, but it is only during recent years that the shores of Novaya Zemlya have been visited by them. Spitzbergen and its neighbourhood used to be the favoured locality; and it was chiefly the dearth of walruses in the Spitzbergen seas that induced the Norwegians to turn their attention and energies in a more easterly direction.

The first of these explorers was Carlsen. In command of a small fishing-boat, he left Hammerfest in 1869. Sailing through Pet Strait, he followed the Siberian coast, and reached White Island, at the mouth of the Obi River, without any hindrance from ice. Captain Carlsen was fully rewarded for his bold and adventurous voyage into the Kara Sea, by the capture of a full cargo of blubber-yielding animals.

This voyage was, however, surpassed in intrepidity by another Norwegian skipper in the same year. Reaching the coast of Novaya Zemlya in May, Captain E. H. Johannesen, in the schooner *Nordland*, succeeded in passing the Matyushin Shar as early as the 9th of June. Ten days later, he was off Cape Nassau. Here, however, his progress was arrested by ice; so, turning southwards, he sailed through the Matyushin Shar on the 17th of July, and working his way south in the land water along the east coast, he reached Burrough Strait. He then resolved upon penetrating into the Kara Sea.

Following almost in the wake of Carlsen, he reached White Island without any impediment from ice. Thence shaping his course to the north-west, he met his first ice in about latitude 75° N. and longitude 71° E. He then steered to the westward, sighting Novaya Zemlya on the 20th of August in latitude 75° 10′. Sailing along the east coast, he passed through Burrough Strait on his homeward voyage.

In 1869, also, Mr. Rosenthal sent out the *Albert*, with Dr. Emil Bessels on board. The track of this vessel, from Spitzbergen to Novaya Zemlya, was between the 75th and 76th parallels; and on August 21st Dr. Bessels was in 76° 46′ N., to the northward of Cape Nassau.

In the following year (1870) Captain Johannesen made another cruise, which quite threw into the shade his previous one, for he actually succeeded in circumnavigating Novaya Zemlya, a feat only once before achieved.

Whilst sailing along the east coast, he must have passed very close to Barents' winter quarters, without, however, perceiving the remains of the house.

In the same year Captain Torkildsen, in command of the schooner *Alpha*, left Trondjem, and passing through Burrough Strait, entered the Kara Sea; but, less fortunate than his countryman Johannesen, he lost his ship, and was obliged to return. The crew were all saved.

Three other Norwegians, Captains Ulvè, Mack, and Qvale, during the same year (1870), made successful voyages around Novaya Zemlya.

Ulve, in the schooner *Samson*, attained the high latitude of 76° 47′ along the west coast; whence he returned south, sailed through the Matyushin Shar, and home by Burrough Strait, thus making the complete circuit of the south island.

Mack, in the schooner *Polarstern*, sailed into the Kara Sea, and navigated it in all directions without meeting ice; whilst Qvale, in the *Johanna Maria*, sailed to the eastward of the mouth of the Obi, returning home through the Matyushin Shar. The year 1870 must certainly be regarded as an unusually favourable one, not only in the Kara Sea, but also along the west coast of Novaya Zemlya. Little or no ice was seen by any of the above-named navigators.

Encouraged by the successful results of these voyages, we find a number of Norwegian walrus-hunters diligently prosecuting their business in the following year, along the coast of Novaya Zemlya. Conspicuous amongst these navigators for his daring, due to long experience in ice navigation, stands our old friend Carlsen.

In his little sloop, named the *Solid*, he sailed from Hammerfest on the 22nd of May, 1871. On the 19th of July he reached the coast of Novaya Zemlya. Shaping a northerly course, he passed Cape Nassau, and, rounding the northern extreme of Novaya Zemlya, anchored off Cape Hooft, on the east coast, on the 18th of August. In this neighbourhood he remained for some days, hunting walruses; and it was whilst the boats were engaged in attacking a couple of these animals, on the 9th of September, that the remains of an old hut were observed on shore. On landing to inspect it, he had little doubt that this was the winter quarters of the brave old Dutch navigator, Willem Barents. Thus Captain Carlsen was the first to enter the Ice Haven of Barents since 1597, its solitude having been unbroken for 274 years.

The house was found to be thirty-two feet long by twenty broad. Around it were strewn many casks, whilst heaps of bones, principally those of reindeer, bears, and seals, were scattered about in all directions.

Captain Carlsen describes the interior exactly as it is represented in a curious old drawing, which accompanied Gerrit de Veer's narrative of the expedition. There stood the bed-places that had been occupied by the sick men nearly three centuries before; there was the bath which had been so ingeniously constructed out of a wine barrel; and there also was the old Dutch clock, which ticked away the weary seconds during that long monotonous winter. The dial plate of the clock was missing, but the works were perfect, though rusty.

Not the least interesting relics were the little flute, and the shoes of a poor boy who is recorded to have died during the winter. Nor ought the discovery of the ship's ensign to be omitted, for it was, in all probability, the first national flag that ever passed a winter in the Arctic regions. Among the few mathematical instruments that were found was a curious semicircular plate made of copper. Through the centre of this plate runs a meridian, and on the left or west side of the meridian are drawn nine arcs. This instrument is supposed to have been invented by Plancius, the famous cosmographer, for determining the variation of the compass, and, when used in connection with the astrolabe, for calculating the longitude at sea. At the time Barents' expedition left Holland, Plancius was much taken up with his theory of ascertaining the longitude by the variation of the compass.

The Dutch Government were fully sensible of the value of these relics, which had been purchased from Carlsen by Mr. Lister Kay, who was travelling in Norway at the time of Carlsen's return. Mr. Kay willingly handed them over to the Netherlands Minister for the price he had given for them, and they are now deposited in a house constructed for their reception in the Naval Museum at the Hague. This house is in exact imitation of the one built by Barents, a sketch of which, as has been already mentioned, accompanied the history of the voyage written by De Veer, who appears to have been both chronicler and artist to the expedition.

Captain Carlsen did not remain more than a day in Ice Haven, during which time he was most assiduous in his endeavours to collect as much as possible. Putting to sea on the 10th of September, a gale of wind compelled him to return and seek refuge at his former anchorage on the 12th, where he remained until the 14th. Steering along the east coast to the southward, he ran more than one risk of losing his ship, and had on several occasions to cut a way through the ice. Eventually, after a most adventurous voyage, during which the circumnavigation of Novaya Zemlya was achieved, he reached Hammerfest on the 4th of November, thanking God, like a good seaman as he was, for his prosperous voyage. Taking into consideration the lateness of the season, this voyage of Carlsen's must be always regarded as one of the most daring on record.

Captains Mack, Johannesen, and Isaksen also made remarkable voyages along the coast of Novaya Zemlya in 1871, and Captain Tobiesen, on the 11th of August, reached the latitude of 78° 8′ N., on the meridian of 42° east of Greenwich.

In the same year the Baron von Heuglin, with Captain Melsom, undertook a voyage in the small screw steamer *Germania*, belonging to Mr. Rosenthal, with the object of reaching the mouth of the Yenisei. They visited the Matyushin Shar, and the Pet and Burrough Straits, but failed in their attempt to cross the Kara Sea.*

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* See "Reise nach Novaja Semlja und Waigatsch in Jahre 1871. Unternommen mit der Rosenthal'schen Expedition von M. Th. von Heuglin" (1870, *Braunschweig*).

The year 1872 was a very unfavourable one in the Barents Sea, for it not only proved disastrous to the Austro-Hungarian expedition, but also to the Norwegians. The death of one of their most intrepid walrus-hunters, who was also an experienced and energetic ice navigator, was the chief event in this fatal year. The schooner *Freya*, commanded by Captain Tobiesen, was beset in the ice off Cross Island, on the west coast of Novaya Zemlya. Being unable to extricate his ship, Tobiesen determined to remain by her, in the hope of saving, if not his vessel, at any rate some of the stores and cargo. Accompanied only by his little son and two seamen, who volunteered to remain, he passed the winter in a small frame house, constructed from materials taken from the vessel, which before the winter set in appears to have become a perfect wreck. The rest of the crew were received on board a Russian fishing vessel and taken to Archangel.

When the island was visited the following summer, the two seamen only were found alive. Tobiesen had died of scurvy on the 29th of April, and his son died of the same disease on the 5th of July. The poor fellows had had a rough and hard winter. Badly provided with food, they subsisted principally on seal blubber and bear's meat, and during the latter part of their stay had only a little salted and half-rotten bear flesh!

Captain Tobiesen was a very distinguished Arctic navigator. He accomplished a most successful and remarkable voyage in 1864, round North-east Land.

Last year, in the *Isbjörn*, I visited the scene of his winter quarters on Cross Island, and found the house standing in much the same condition as when its late occupants had resided there, whilst remains of the ill-fated ship and her cargo were strewn along the beach.

The last voyage undertaken by the Norwegians, to which I shall refer, was one performed in 1878. In command of the schooner *Nordland*, Captain Johannesen has enriched Arctic geography by the discovery of a hitherto unknown island in the Siberian Sea, to which he gave the very appropriate name of *Insel Einsamkeit*, which means Lonely, or Solitude, Island. Leaving Tromsö on the 22nd of May, he directed his course towards Novaya Zemlya, which he reached on the 6th of the following month, having met ice, not however sufficient to impede him, two days before. Sailing north, the Pankratjeff Islands were reached on the 21st, and Cape Mauritius a month later. On the 30th of July, having passed through some streams of loose ice, Johannesen arrived at Barents' Ice Haven. Sailing the next day, he cruised, until the 10th of August, off the north end of the island, hunting for walruses. On that day he shaped a course to the eastward, meeting with but little ice, but being greatly pestered by fog and rain. On the 16th, during a brief interval of clear weather, land was sighted bearing about south-south-east. This was the coast in the vicinity of Cape Taimyr. Thence he sailed west and then north, occasionally working through loose ice, but never in sufficient quantity to create either alarm or anxiety.

On the 28th of August, to his great surprise, he sighted an island bearing north-west. On the 1st of September he sailed along its south shore, then up the west coast to the north, and so made a complete circuit of the island. The west side Johannesen reports as being steep and precipitous, rising to an altitude of about one hundred feet; but the east coast was low, and on it lay large quantities of driftwood. On this side landing would be practicable, provided the sea was unencumbered with ice. In the centre of the island there appeared to be a lake, but no vegetation could be discerned. Bears, walruses and seals, and many kinds of birds were seen. The position of the island was set down in latitude 77° 40′ and 86° east longitude. Sailing on the 3rd of September, Johannesen shaped a course to the north-west, and reached the 78th parallel of latitude without seeing ice. On the 6th he was off the east coast of Novaya Zemlya, and here also no ice was visible. He reached Tromsö, after a most adventurous and successful cruise, on the 27th of September.

Three English yachtsmen had visited the shores of Novaya Zemlya previous to our cruise in 1879; namely, Major Palliser, Mr. Lamont, and Mr. Gardner. Major Palliser, in 1869, reached the northern coast, and fell in with extensive ice fields off Cape Nassau; but they were broken up by stormy weather, and he believed that he could have circumnavigated Novaya Zemlya without much trouble. He was prevented from doing so owing to his scanty supply of provisions. He shaped a southerly course, passed through the Matyushin Shar, entered the Kara Sea, and got within a few miles of White Island. Mr. Lamont's voyages to Novaya Zemlya, in 1869 and 1870, were undertaken for sporting purposes. In 1869 he touched at Gooseland on June 12th, then sailed northwards along the west coast as far as Admiralty Peninsula, and returned towards Spitzbergen, in about the 76th parallel, during June. In 1870 he passed through the Pet and Burrough Straits into the Kara Sea, and sailed round Waigat Island in July and August. He also passed through the Matyushin Shar on July 14th, went up the west coast as far as 75° north, and then returned southwards. The voyage of Mr. Gardner, in the steam yacht *Glow-worm*, was more important. He made the ice on July 4, 1875, about twenty-five miles to the westward of Gooseland, and was stopped by an impenetrable barrier a few miles north of Matyushin Shar. But he found the strait perfectly free from ice on the 25th of July—a very unusual occurrence—and he was thus enabled to enter the Kara Sea very early in the season. He then shaped a northerly course, and in the face of continual fogs, entered the Ice Haven of Barents on the 29th of July, finding the bay still full of fast ice. During three days Mr. Gardner made most careful researches round the ruins of the old house which formed the winter quarters of Barents and his crew. In spite of the large number of objects collected by Carlsen in 1871, Mr. Gardner succeeded in bringing together a highly interesting collection of more than a hundred different articles, which he generously presented to the Dutch Government on his return. On August 2nd he shaped a course to White Island, but it was impossible to make more easting owing to the ice floes, and finally he was obliged to go southwards along the east coast of Novaya Zemlya, in the land water. On the 23rd he passed through Pet Strait, and reached Hammerfest on the 28th. The voyage of Mr. Gardner is very remarkable, both as regards the extraordinarily early passage of the Matyushin Shar, and the navigation along the whole extent of the east coast.

CHAPTER VI.

AUSTRO-HUNGARIAN, SWEDISH, AND DUTCH EXPEDITIONS IN MODERN TIMES.

ONE of the most important expeditions undertaken in modern days, in the direction of Novaya Zemlya, was undoubtedly that sent out in 1872, under the joint leadership of Lieutenants Weyprecht and Payer.

Before starting upon their main enterprise, these two distinguished officers had made a pioneering voyage in the little cutter *Isbjörn*, the previous year. This preliminary cruise was eminently successful, for the explorers attained the latitude of 78° 38′ in the Barents Sea, a higher position than had hitherto been reached in that direction. The ice met with presented no serious impediment to their further progress, but the season was well advanced, their vessel was small, and they were desirous of getting home in order to make preparations for the more important voyage they were going to undertake in the following year. For the same reason, they did not wish to run any risk of being caught by the ice and frozen up for the winter. Weyprecht, during this voyage in the *Isbjörn*, received his initiation as an ice navigator. Payer had previously served in Koldewey's expedition on the east coast of Greenland, and had already won his laurels as a daring Arctic traveller.

In consequence of the successful results of the cruise of the *Isbjörn*, it was decided that a new expedition should proceed to Novaya Zemlya, and attempt to perform the north-east passage by rounding the northern end of that island.

The *Tegetthoff*, a steamer of 220 tons, was selected to carry out this design. The command of her was entrusted to Weyprecht, whilst Payer, who was a military officer, was to organize and take charge of the sledge travelling-parties. Captain Carlsen, the well-known Norwegian navigator, and discoverer of the Barents relics, also accompanied the expedition in the capacity of ice pilot and harpooneer. The officers and crew amounted in all to twenty-four souls, two of whom were experienced mountaineers from the Tyrol.

It must be distinctly understood that it was not the object of this expedition to search for the land which, from the results of the pioneering voyage of the *Isbjörn*, they anticipated would be found north of Novaya Zemlya, but to make the north-east passage.

The *Tegetthoff* sailed from Bremerhaven on the 13th of June, 1872, furnished with stores and provisions calculated to last about three years. On Sunday, the 14th of July, she left Tromsö, and this was the last port the ill-fated ship was ever destined to sail from.

On the 25th of July the first ice was met with, in latitude 74° 30′, but, with the aid of steam, they had little difficulty in forcing their way through. The ice consisted of loose fragments of light stuff, in no way comparable to the large heavy floes which Payer, five years before, had encountered off the east coast of Greenland. Its position, however, was ominous; for the ice is rarely seen so late in the year in such a low latitude. For a few days in the early part of August they were beset, and were only able to extricate themselves by constant and unwearied attention and labour.

In latitude 75° they reached a clear sea, extending along the west coast of Novaya Zemlya.

On the 12th of August they were met by the little cutter *Isbjörn*, which had been chartered by Count Wilczek, one of the chief promoters of the enterprise, for the express purpose of establishing a depôt of provisions for the use of the crew of the *Tegetthoff*, in case of any accident happening to that ship. The Count was accompanied by Commodore Baron Sterneck, by Professor Hofer, a distinguished geologist, and by Herr Berges, a photographer.

The depôt was landed and formed on one of the Barents Islands, at a spot rather gloomily designated the "Three Coffins."

On the 20th of August, some changes in the ice having taken place, and navigation being apparently possible, the two vessels separated, the little *Isbjörn* bound homewards, the *Tegetthoff* with the vast unknown before her.

How little did those on board the latter ship dream, when they parted with their generous and kind-hearted friends on board the cutter, that they had run to the end of their tether, and that their good stout ship, in which all their hopes were centred, was doomed never again to plough the seas in all the pride and beauty of a free and unrestrained vessel? On that same afternoon, a few short hours after they had bade farewell to their countrymen, the ice closed round the unfortunate *Tegetthoff*, and, to use Payer's own words in his graphic and interesting narrative, "never again were we destined to see our vessel in water."

The Ice King had effectually seized her in his insidious embraces—a fatal hug indeed, from which she was never known to be released, although inhabited for two weary years! During that long period, to quote again Lieutenant Payer's words, they were no longer discoverers, but passengers against their will on the ice.

The season of 1872 was an unusually severe one, and the pack by which they were surrounded was soon solidified into an impenetrable mass, which quite precluded all hope they may have entertained of immediate extrication.

Thus imprisoned, they drifted helplessly to the north-east. The position in which they were first beset was 76° 22′ north latitude and 63° 3′ east longitude, only a few miles off Cape Nassau. Their existence, however, was not one of monotony, for their situation, although a helpless one, was not devoid of unpleasant excitement. Terrible commotions would frequently occur in the pack, subjecting their ship to fearful pressure from the ice. On these occasions instant preparations had to be made for deserting the *Tegetthoff*, in the not improbable event of her destruction. This state of disagreeable activity had to be endured by them for the whole period of two years that they were doomed to spend in the ice.

Although special care was observed to keep the crew employed during the long dark winter, scurvy and affections of the lungs made their appearance. Their small stock of wine was reserved for the exclusive use of the sick; and the others had to content themselves with a decoction made on board, and which, for lack of a better name, was called "artificial wine." Its component parts were glycerine, sugar, extract of meat, tartaric acid, alcohol, and water!

After an absence of 111 days, the sun made its reappearance above the southern horizon, and the hearts of all on board the *Tegetthoff* beat high, as they looked forward to the cheering prospect of being speedily released from their icy bondage. But, alas! they were doomed to bitter disappointment. The summer came and went. The autumn arrived, and still there were no signs of a disruption of the pack—the one thing needful to insure their liberation. Autumn passed, and the cold, dread hand of a second winter enclosed them in its icy grip. Suddenly all were aroused into joyful animation by a grand discovery. The navigable season had ended, and with it all hopes of deliverance; but on the last day of August, when preparations for the second winter were being thought of, the startling cry reverberated through the whole ship of "Land, land to the north-west."

The news spread like wildfire. Everybody rushed up from below to convince themselves that the report was correct.

Yes, there was little doubt about it! Revealed to them by the sudden lifting of the mist were the bold outlines of a mountainous country. All past hardships and anxieties were forgotten as they gazed upon this land, which had for so long been concealed from the knowledge of men, and they felt that their expedition was, after all, no failure, but a great and complete success. All was now joy and mirth. The poor ice-buffeted and weather-beaten *Tegetthoff* was gaily dressed with flags, and, with loud hurrahs, the newly discovered territory was named after their emperor and king, Franz Josef Land.

From that time forth until its exploration, there was hardly a day, or even an hour, in which their thoughts were unoccupied by this mysterious land.

Towards the end of October they approached within three miles of one of the islands outlying the main mass of land. This approach, it must be observed, was entirely due to the drift to which the ship and ice had been subjected, caused by winds and currents, since her first besetment. There was yet time, before the disappearance of the sun would wrap them in the eternal gloom of a long winter's night, to investigate the mysteries and break the seclusion of this newly found island. Every consideration was thrown to the winds; they resolved to effect a landing, or perish in the attempt.

Making their way over rough and rugged hummocks, and clambering through deep snow-drifts, they at last succeeded in reaching *terra firma!* Never were men so elated. It was the first time they had landed since leaving the Barents Islands, nearly fifteen months before, and they all experienced that peculiarly pleasurable sensation felt by those who are the first to discover and tread upon shores which have never before been visited by human beings. The latitude of the island, which was named after their great friend and supporter, Count Wilczek, was 79° 54′.

Although to their imaginations this island appeared a very paradise, it was, after all, a barren and sterile land. The vegetation was meagre in the extreme, consisting only of a few lichens; driftwood, which they expected to find, was conspicuous by its absence; and no traces of animals could be observed.

They were unable to complete the exploration of Wilczek Island before the long dark night was upon them, and further investigations had to be deferred until the following spring.

A second polar night, 125 days in duration, had to be endured, but it was a decided improvement on the last one. In the first place, there was no further pressure from the ice; the ship, frozen firmly into a floe, was fixed and immovable, surrounded by icebergs, which, being grounded, prevented the floe from drifting about; whilst the prospects of the exploration of new lands during the ensuing spring, and then the homeward voyage, stimulated all to renewed exertions, and gave such mental occupation to the men as assisted very materially in driving away depression and despondency, and thereby improving their sanitary condition. In the month of January the cold was severely felt; mercury remained frozen for many days, even the petroleum in the lamps froze, and brandy was congealed into a solid mass.

During the winter a sledging party was organized for the exploration of the newly discovered country, which was to be led in the spring by Payer. On its return, it was resolved that the ship should be abandoned, and an attempt made to return to Europe by means of boats and sledges.

On the 10th of March the first real sledging expedition left the ship. They travelled in a northwesterly direction, along the coast of Hall Island, ascended Capes Tegetthoff and McClintock, 2500 feet in height, and traversed the picturesque Nordenskjöld Fjord. The land was utterly devoid of life, and covered with a mantle of glaring white snow. The cold was intense, and they suffered severely from frost-bites. This party was only away six days. On the 24th of March Payer made another start, and such good use did he make of his time, that he succeeded in sledging across Austria Sound, and along the coast of Crown Prince Rudolf Island, to as far north as latitude 82° 5′. Taking all the difficulties into consideration, this journey of Payer's must always be regarded as a very remarkable one. His highest position was reached on the 12th of April, and was about 160 miles distant from his ship. Twelve days afterwards they were again on board the *Tegetthoff*, very much relieved in mind to find that she had not drifted away from the spot where they had left her, of which grave apprehensions were entertained, on account of the anticipated disruption of the ice in the spring.

A few days having been devoted to the repose they were sadly in need of, the indefatigable Payer started again on his third sledge journey on the 29th of April, to explore the western portions of Franz Josef Land.

McClintock Island was explored, and the land on the opposite side of Markham Sound mapped. They also named Richthofen Peak, a pyramidal-shaped mountain of about five thousand feet in height, the loftiest they had seen in Franz Josef Land.

Payer returned to his ship on the evening of the 3rd of May, feeling satisfied that everything had been accomplished in their power to further the objects of the expedition. In this feeling all those who take an interest in, or who have any knowledge of, Arctic matters will cordially concide. The great wonder is that so much was performed under the peculiar circumstances in which they were situated. It was indeed a brave and gallant act, to absent himself, as Payer did, for so many days from his vessel, with the uncertainty whether on his return to the position the *Tegetthoff* occupied when he set out, any ship would be there to receive him! It was quite on the cards that a movement of the ice would have carried her away, and he would then be left on the shore of that barren land, abandoned and provisionless! The fate that awaited him in this contingency was only too well known to him and his noble little band.

On the 20th of May, all the arrangements having been concluded, the colours were nailed to the mast; the ship which had been their home for two long years, and two such years are almost equivalent to a lifetime, was deserted, and, with the exception of one poor fellow who had found his last resting-place in that wild waste of snow and ice, the officers and crew of the *Tegetthoff* started on their homeward journey.

Their equipment was of the simplest kind. Provisions, ammunition, etc., sufficient for 150 days, were packed in four boats placed on sledges, and three other sledges were also taken. The personal property of each member of the expedition consisted of one blanket to sleep in! The difficulties they had to contend with, and the toilsome nature of the work, may be conceived when we hear that, after two months of incessant labour, they had only accomplished a distance of eight miles from the ship!

This was indeed disheartening work; but relief came at length, for on the 14th of August they succeeded in reaching the edge of the pack in latitude 77° 40′, and, launching their boats once more on their proper element, with light and thankful hearts they bade adieu to that icy world in which they had been so long imprisoned. Four days afterwards, they set foot on shore in Novaya Zemlya, and on the evening of the 24th they met a Russian schooner, which conveyed them in safety to Vardö, whence they proceeded by steamer to Hamburg. The reception of the members of the expedition, wherever they went, was most enthusiastic and cordial. Everybody evinced a hearty desire to offer a welcome to these brave men who had dared and done so much. Congratulations poured in upon them from geographers of all nations, and they were further honoured by personal congratulations from their Sovereign.

Lieutenant Payer attributes the salvation of his party to their good fortune in finding the edge of the pack in so high a latitude. Had it been as far south as it was when the *Tegetthoff* was beset in 1872, the whole party must have perished, for their rate of travelling on the ice was so slow that their provisions would have been expended before the water was reached, and starvation would have stared them in the face.

The voyages of Professor Nordenskjöld, undertaken with a view to opening a commercial route to Siberia and discovering the North-East Passage, comprised much scientific exploring work in the Novaya Zemlya group and the surrounding seas. In 1874 Captain Wiggins, in the little steamer *Diana,* had passed through Burrough Strait, and freely navigated the Kara Sea in July and August. He was followed by Professor Nordenskjöld in the year 1875, in the Norwegian sloop *Pröven,* of seventy tons. From the 7th to the 13th of July the Professor was in the Matyushin Shar, but the strait was blocked with ice in the eastern end, which obliged the explorers to go southwards. The Kara Sea was entered by Pet Strait on the 31st of July, and the mouth of the Yenisei was reached. Nordenskjöld went back overland, and the *Pröven* was taken home by his companion Kjellman. She reached the eastern entrance of the Matyushin Shar on the 4th, and sailed through it on the 10th of September, arriving at Tromsö on October 3rd.

In 1876 Professor Nordenskjöld undertook a second reconnoitring voyage in the direction of the North-East Passage, in the steamer *Ymer*, of 400 tons. On this occasion he passed through the Matyushin Shar on the 31st of July, and anchored off Rosmyssloff's winter quarters near the eastern entrance. He then steamed southwards along the coast to Burrough Strait, and reached Dickson Harbour, at the mouth of the Yenisei, on August 15th. Here the *Ymer* remained until the 2nd of September. She returned through the Matyushin Shar on the 7th, and arrived at Tromsö on the 22nd of the same month. Thus the Swedes had traversed the Matyushin Shar three times; but when the *Vega* undertook her memorable voyage to discover the North-East Passage in 1878, the passage into the Kara Sea was effected by the Pet Strait, Dickson Harbour being reached on the 6th of August. The only expeditions to Novaya Zemlya which had made scientific collections were those of Baer, of Von Heuglin, of the Austrians, and of Nordenskjöld; and the Swedes were the first to make collections on the eastern shores of the islands, and in the Kara Sea.

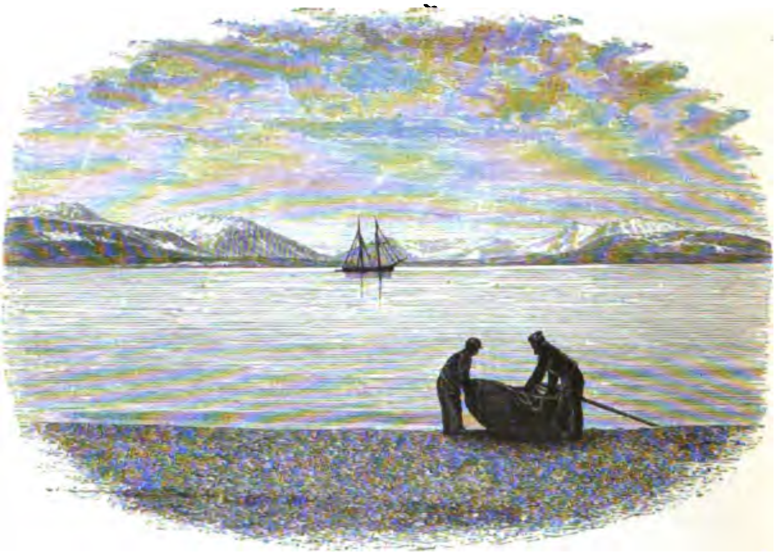
The next expedition I would call attention to is that of the Dutch in 1878. Fired by the gallant deeds of their forefathers, the people of Holland had, under the guidance of that distinguished officer, Commodore Jansen, of the Royal Netherlands Navy, subscribed a sum of money sufficient to build and equip a small sailing schooner, with the professed object of erecting memorial stones in Spitzbergen and Novaya Zemlya, recording the discovery of those islands by Willem Barents.

Lieutenant Koolemans Beynen, of the Dutch Navy, who had accompanied Sir Allen Young in his two voyages in the *Pandora* as a volunteer, nobly seconded Commodore Jansen in his endeavours to collect the necessary funds to defray the expenses of the proposed expedition. The enthusiastic zeal of this young officer in all that related to the glorious work of Polar exploration, was so contagious amongst the supposed phlegmatic inhabitants of Holland, that he had little or no difficulty in obtaining the required amount. A small sum only was requisite, for they did not, for the present, aim at achievements of great magnitude.

A little schooner called, after their great Arctic explorer, the *Willem Barents*, was built, and sailed from Amsterdam on the 5th of May, 1878. She was commanded by Lieutenant de Bruyne, whilst Beynen sailed in her as first lieutenant. She had a complement of six officers and eight men. Among the former was Mr. Grant, a young English gentleman, an ardent photographer, who, like Beynen, had sailed with Allen Young in the *Pandora.*

The Dutch Government, acknowledging the valuable results likely to be obtained by the expedition, and wishing to share in the responsibility, appointed officers from the navy, and allowed the little vessel to be fitted out and provisioned at the Royal Dockyard at Amsterdam.

Having visited Jan Mayen Island and Spitzbergen, the *Willem Barents* sailed across to Novaya Zemlya, occupying the time, whenever opportunities occurred, in sounding, dredging, and obtaining serial temperatures, and thus adding largely to our knowledge of the physical geography of those regions. Experiencing very bad weather, and some rude handling by the ice, at one time narrowly escaping being beset for many days, the *Willem Barents* succeeded in entering the Matyushin Shar on the 20th



MATYUSHIN SHAR, LOOKING TOWARDS TJIRIKINA VALLEY.

of August, and anchored in Tjirikina Bay to complete with water. Here she remained for five days, the time being profitably spent in taking a series of magnetic observations, the scientific staff being usefully employed in making other important and interesting investigations in natural science.

Working up along the west coast, they reached the Pankratjeff Islands on the 29th of August, and, shortly afterwards, landed and visited the depôt of provisions established by Count Wilczek on one of the Barents Islands, for the use of the crew of the *Tegetthoff*. These they found intact, and, apparently, in an excellent state of preservation. On the same day Cape Nassau was reached, and here their troubles commenced, for it was on this promontory that a memorial tablet was to be erected.

Villainous weather, and difficulty in distinguishing which was the true Cape Nassau, prevented them from carrying out one of the principal duties that devolved upon them. It was, however, no fault of theirs, for twice was the stone placed in position, and twice was it discovered to have been put on the wrong cape! If they could only have obtained astronomical observations, and so have determined with exactness the position of the land, all would have been well, but gales of wind, dense fogs, and driving snowstorms so obscured the sun that they were unable to obtain sights.

Relinquishing the attempt on the 5th of September, De Bruyne made a plucky push northwards, and reached the latitude of 78° 17′ before he was stopped by ice. The vessel's head was then turned homewards, and they arrived in Holland on the 12th of October, where they received a warm and enthusiastic reception; for, in spite of great obstacles, they had done their work diligently and gallantly.

Before concluding this chapter, in which I have given a very brief relation of the recent exploits of the gallant Dutch in those regions which are historically associated with the daring deeds of their forefathers, I avail myself of the melancholy pleasure which is now afforded me of testifying to the noble disinterestedness, the gallantry, and unwearied zeal of the late Koolemans Beynen, the sad news of whose untimely death has just reached me.* Cut off in the very prime of life, in the bloom of manhood, Holland has indeed sustained an irreparable loss in the death of this accomplished officer, whom I was proud to call "friend."

Burning with enthusiastic ardour to see his national ensign once more unfurled in the Arctic zone, this noble young man, encouraged and befriended by Commodore Jansen, the patron of Arctic enterprise in the Netherlands, traversed the country, giving lectures in all the chief towns on the importance of Arctic exploration, so as to raise funds in order to meet the necessary expenses for the building and equipment of the *Willem Barents.* It is not too much to say that the despatch of the Dutch expeditions of 1878 and 1879 was, in a great measure, due to Koolemans Beynen.

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* Lieutenant Koolemans Beynen, to his great disappointment, was ordered to join a ship in the East Indies in 1879, instead of being allowed to serve in the second Dutch Arctic Expedition. He died at Macassar, November 10th, 1879.

Not only is his loss mourned in his own country, where he was as well known as he was popular, but it will be felt by all geographers, and by all those who have the true interests of scientific exploration in high latitudes at heart. His dearest wish was to see his countrymen once more resume their place in the van of Arctic research. Let us hope that the bright example which he has left will so encourage the younger officers of the Dutch Navy that they, inheriting his enthusiasm, will endeavour to fulfil his wishes. The noble labours of Koolemans Beynen will not then have been spent in vain.

CHAPTER VII.

THE "ISBJÖRN."

THE foregoing chapters were written with a view to giving a complete, though brief, sketch of previous exploring work in Novaya Zemlyan waters. They are intended as introductory to the narrative of our cruise in the *Isbjörn*, by making known what had already been accomplished in the regions we were about to visit.

Since the discovery of Novaya Zemlya by Willoughby, it will have been seen that but little had been accomplished in that country, in the shape of exploration, by Englishmen. Three yachtsmen only, Palliser, Lamont, and Gardner, have visited its shores.

Russian, Dutch, and Norwegian navigators roughly surveyed the islands, and it is almost entirely from their accounts that our present knowledge of Novaya Zemlya is derived.

So little did we know or care about this region, that the Admiralty charts, except the circumpolar ones, which are on a very small scale, do not even now take in the north and north-east parts of the northern island, and we were therefore compelled, before leaving England, to get a Russian chart, on which was engraved the whole extent of coast line from north to south!

Although the notice to start was short, yet our preparations were soon completed, and at midnight of the 1st of May we steamed out of the Humber in the good ship *Tasso*, bound, as Dryden puts it—

> "To those cold regions which no summers cheer,
> Where brooding darkness covers half the year."

On the evening of the 3rd of May we sighted the island of Udsire, with its two light-houses, the lights of which are visible on a dark night for twenty-two miles, and shortly after four o'clock the next morning we anchored off the town of Bergen.

It was a lovely morning as we steamed up the Kors Fiord, and although the sun did not rise until four o'clock, the twilight was so strong and bright, that we steamed boldly in without waiting for the appearance of the orb of day. The water, as we wended our way through the fiord, was as smooth and unruffled as a mirror, clearly reflecting in its dark bosom the land on either side, studded with prim-looking villages and quaint churches, whose steeples were conspicuous above the gable-roofed houses of various bright colours. The country itself looked wild and sterile, with but little vegetation, and no cultivated plots of ground of any description were to be seen. Innumerable piles of fish, however, could be observed stacked in heaps along the rocks. These heaps are composed of cod, which are spread out during the day to dry, and stacked every evening.

As we approached the anchorage, the sun rose bright and clear over the eastern hills, tingeing the summits with a rich golden hue, and shedding its rays into the deep fiords on the opposite side. The mountains still partially preserved, in long white strips, their wintry coating of snow.

Suddenly the sharp, discordant screams of our steam-whistle notified to those on shore the arrival of the *Tasso*. As we listened to the signal, gradually fading away into a low plaintive wail, we were startled to hear a similar sound apparently issuing from the nearest village, repeated two or three distinct times from the hills at the back, and then reverberating from the mountains in the far distance. It was the most remarkable and perfect echo I ever listened to.

A description of the town of Bergen would be out of place here. It has an established reputation for possessing one of the greatest rainfalls of any place in the world.* We were lucky enough to find it under two different aspects. On the day of our arrival the weather was perfectly charming, and, being Sunday, the inhabitants turned out like butterflies, in their gayest and brightest habiliments, to revel and bask in the sunshine. On the following day, however, the town was in its normal condition, and subjected to a most persistent and heavy downpour of rain. Having, through the kind courtesy of Professor Astrand, the superintendent of the Observatory, obtained a rate for our chronometer, and made one or two necessary purchases in the town, we bade farewell to Bergen on the evening of Monday, the 5th of May, and continued our course northwards in the *Tasso.*

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* But this is undeserved, for in reality its rainfall is by no means excessive in comparison with many other places.

We were the only saloon passengers on board, so the captain very good-naturedly studied our, as well as his own, convenience regarding our meal hours; so arranging that we sat down to breakfast, luncheon, and dinner when the ship was in comparatively smooth water, as she passed between the numerous small islands that fringe the coast and the mainland. Outside, a strong north-westerly gale was blowing, accompanied by a heavy sea, which caused us to roll and pitch in a most unpleasant manner whenever we were exposed to its influence.

As we heard before leaving Bergen that there was little chance of arriving at Trondjem before the departure of the Norwegian steamer for Tromsö, we resolved upon landing at a small station called Beian, about twenty miles from Trondjem, where both the outgoing and incoming steamers touched, so as to make quite sure of catching our vessel. In order to execute this design, we were under the necessity of getting the Custom-house officers on board at Bergen for the purpose of unsealing the hatches, so that we might get our luggage out; otherwise the seals would not be broken until after the steamer's arrival at Trondjem. This was effected, although not without some difficulty, for the Norwegian Custom-house officials are as perverse and pig-headed as those of other countries.

Early on the morning of the 7th we reached Beian, and, to our great relief, saw the northern steamer approaching. Both vessels stopped, and at four a.m., in the middle of a heavy snowstorm, we were transferred to the Norwegian steamer *Lofoten*, like true Arctic navigators covered with a white mantle of snow.

My companion had brought with him a Scotch collie, named Gouch, for hunting purposes in Novaya Zemlya, and although he was aware that a very strict law was in existence prohibiting the landing in Norway of any dogs from England, he hoped no difficulty would have been made in this instance, as he intended transferring the dog at once from the steamer to our little vessel in Tromsö, without permitting her to land. The officers of the *Lofoten*, however, regarded their vessel as Norwegian territory, and refused admittance to poor Gouch, who had therefore to be sent back to the *Tasso*. This contingency was not unforeseen, and arrangements had been made with Captain Johnson, of the last-named ship, who had very good-naturedly offered to take her back to England. The poor old doggie put on a very mournful and woe-begone expression when she found she was not to accompany us, and was carried away in the driving snow by perfect strangers. We were not uneasy regarding her, for we knew she would return in the company of kind friends; for she, cunning dog as she was, had not only made friends with the captain, but also with the steward and cook of the *Tasso*.

After all, we were not deprived of the services of poor Gouch, for Captain Johnson, on his arrival at Trondjem, kindly interesting himself in our behalf, obtained permission from the Government at Christiania for the dog to be allowed a passage north, and she subsequently joined us at Tromsö, having been forwarded by the next steamer.

The *Lofoten* was a comfortable, well-found steamer, with well-furnished cabins—which might, however, be improved if provided with rather larger wash-hand basins and more abundant and cleaner bedding! She is one of a line of steamers which perform the regular postal service along the Norwegian coast, and therefore stops at every station, of which there are about forty, between Trondjem and Tromsö. At some places the detentions are of short duration, according to the number of passengers or the amount of cargo to be got on board; but at others, where coal has to be taken in, the delay is frequently of many hours. Our connection with the Norwegians was of the most pleasant and cordial kind, and I shall always regard with pleasure my cruise in that country, and the friendships that I formed.

The scenery was very grand as we steamed up through the fiords, inside the mass of islands that afford protection to the western coast of Norway from the tumultuous waves of the North Sea. There was no doubt about the direction in which we were steering, for every day seemed to add to the already large accumulations of snow that clothed the hills and lined the valleys, rolling downwards in huge white impervious mantles to the sea itself. Occasionally a few straggling forests of pine trees, their branches decked with flakes of feathery snow, would be passed, whilst here and there solitary trees were seen standing apart like gaunt sentinels, guarding the dreary waste. Remote and dismal-looking houses, and lonely farmsteads, lay scattered about in the most unlikely spots, rather tending to relieve the desolate monotony of the landscape.

Marine architecture in the northern parts of Norway does not appear to have kept pace with that of other countries in modern times. In one of the fiords we saw the oddest of quaint little steamers, which, we concluded, must have been built on the same model as the ark, even if it was not constructed at about the same period, and had recently been supplied with engines and a propeller!

The fishing-boats, and even the larger class of vessels, styled *jægts*, appear to be built on precisely the same lines as the ships in use three centuries ago, exact illustrations of which will be found in Gerrit de Veer's history of the voyage of Willem Barents. These boats are extremely high at the bow and stern, but they have a very low freeboard amidships, being much in the shape of a half moon, the horns pointing upwards. They possess great beam, and have one mast stepped in the centre, fitted with a large lugsail. They are, I believe, admirable sea-boats, and will remain out, so long as fish are obtainable, in the most boisterous weather.

At eight o'clock on the morning of the 8th of May, we crossed the Arctic circle in a thick snowstorm—a fitting introduction to the realms of the Ice King. The crew were continuously employed in clearing the deck of snow, whilst icicles, pendent from the weather side of the deck-house, conclusively denoted that the temperature was below freezing-point. The thick weather that prevailed not only clashed with our enjoyment of the scenery, but it also sadly interfered with the progress of our vessel, as we were constantly compelled to stop until a slight lull or clearance in the dense fog or snow enabled our pilot to recognize the land and proceed. The country had certainly a very Arctic appearance, the few habitations and isolated churches that we occasionally saw looking utterly dreary, as they seemed to spring up out of a vast waste of snow.

It was tantalizing to know that we were passing such interesting places as the island of Lekö, the perforated Torghatten Fjeld, and the Seven Sisters, without being able to indulge ourselves with a view of them. One of the latter, however, thanks to a brief lull in the weather, we succeeded in catching a passing glimpse of, but the remainder of the family, perhaps more modest and bashful than their sister, remained enshrouded in an impenetrable veil of mist. The one we saw was a noble conical-shaped hill, rising abruptly to a height of nearly three thousand feet above the level of the sea.

Of course, in such a country as Norway, replete with legendary history, these places are all associated with mythical tales of the past. One of them tells how a lovely giantess was loved by a giant, and how she fled from him, and sought refuge in the island of Lekö; and how, infuriated, he checked his steed, and aimed an arrow at the terrified maiden, and how the arrow, flying onwards, pierced the hole still to be seen in Torghatten; but the Nornerne,* taking pity on the helpless girl, let the rays of the setting sun fall on her, and so changed her into stone, and her cruel persecutor as well, who now figures as Hestmandö, from the fancied resemblance this island bears to a man on horseback; while in Lekö a figure of stone is seen, whence the name Lekömoen (the maiden of Lekö).

The Seven Sisters are a cluster of mountain peaks, nearly equidistant one from another, and about the same height. They are composed of grey rock, and are destitute of all traces of vegetation. They form a very conspicuous landmark for any vessel making the land from leeward in that direction.

The Torghatten Fjeld† is a high hill, in which, at several hundred feet from its base, is a very remarkable hole extending right through the hill. Of course, there is a legend attached to it, and, of course, it is also a love story! It is related that a giant having fallen in love with one of the Seven Sisters, and his tender feelings not being reciprocated, in his anger at being rejected, he threw a large stone at the object of his affections; this striking the Torghatten Fjeld, which luckily intervened between himself and the young lady, made the hole, which is now distinctly visible in fine weather from the steamers as they pass to and fro.

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* The Northern Fates.

† According to Norwegian description, four hundred feet.

The evening before we reached Tromsö was a lovely one, quite making amends for the previous bad weather we had experienced, so soon does joyous sunshine make us forget past cloudy skies. Although the midnight sun was not visible above the horizon, it was so little below at that hour, that lamps in the saloon and cabins were no longer necessary, and were therefore dispensed with. As we steamed through a narrow channel at about eleven p.m., the water was so perfectly placid, and acted upon by a leaden-coloured sky overhead, that we appeared to be forcing our way through a sea of molten lead. At the same time, a most lovely violet-tinted colour, gradually deepened into a purple until it blended with the more sombre-tinged sky overhead, illumined the southern heavens; whilst the rays from the slowly setting sun lit up the lofty snow-clad hills and misty mountain tops with a radiance that can only be seen and enjoyed in high latitudes.

It was difficult to imagine more perfect stillness, until disturbed by the discordant screech of our steam-whistle, as we approached a station that nestled at the base of the hills. The echo of the shrill blast startled a little blue fox that was busily engaged in some predatory raid on the outskirts of the settlement, and sent it scampering up the valley for dear life, frightened at the hideous, noisy monster that dared to disturb the peaceful solitude of the silent midnight.

At length, on Saturday, May 10th, we reached Tromsö, just nine days after we had left London.

As we approached the "most northern city in the world"—for the diocese of Tromsö is in spiritual charge of a bishop—the harbour opened out to our view, crowded with numerous fishing-boats and small vessels. Our telescopes were at once called into active requisition, in order that we might the more readily distinguish the little vessel that was to be our home for some months.

Soon a large gay flag was seen fluttering, in all the brightness and glory of new bunting, from the mast-head of a small black cutter with a newly painted yellow riband round the hull. On this flag could be distinguished the letters ISBJÖRNEN.

This, then, was our little craft. We gazed on her for some time, as may be imagined, with great interest; and from her outside appearance, our first impressions of her were decidedly favourable. She was of trim, rather rakish appearance; her spars had been newly scraped and varnished, and she was shining with fresh paint. She was cutter rigged, but carried, in addition, a square topsail—a sail peculiar to the Norwegian vessels employed in ice navigation; for with its assistance the speed of a vessel, when likely to come into contact with the ice, may be almost immediately checked.

Before our steamer was fairly anchored, a boat shoved off from the shore, in which was seated a respectable looking old seaman, who saluted us as he passed under the stern. On coming on board, he made his way to where we were standing, and politely accosted us; but as he was unable to understand a word of English, and we were in nearly the same predicament regarding our knowledge of his language, it was some time before we discovered, that the individual in question was no other than our worthy skipper and owner, Lars Jorgensen.

With the assistance of Mr. Mack, who was acting in the capacity of agent to Sir Henry, and through whose instrumentality the *Isbjörn* had been chartered, we succeeded in getting all our numerous packages on shore, and safely stored at the hotel and in Mr. Mack's office. Then came the most important part of the day's proceedings, namely, a visit of inspection to the *Isbjörn*. She had already, as my readers will perhaps remember, acquired an historical celebrity by her exploits under Weyprecht and Payer, and subsequently under Count Wilczek.

She was a vessel of forty-three tons burthen, was fifty-five feet long, possessing a beam of seventeen feet. The *Isbjörn* had been expressly built, in 1870, for ice navigation, and was in consequence extra strengthened, having considerable beam power inside, whilst she also had a three and a half inch oak doubling fastened on to her hull outside.

Taking her size into consideration, she appeared to be fairly well adapted for the cruise in contemplation. On her stem were bands of iron, to protect the bow when charging the ice, similar to those used in the Dundee whalers, whilst the forepart of the ship inside was strongly fortified by stout diagonal beams and timbers. On her stern was a rude device of a polar bear, and on each bow a roughly carved image of a walrus.

As the *Isbjörn* was never intended, when built, to be anything but a cargo-carrying vessel, the quarters of those living on board were necessarily sacrificed to her carrying capacity. Our accommodation was, therefore, limited, and was rather snug and cosy than large and commodious. The cabin, common to my companion and myself, in which we slept, lived, ate our meals, and, in fact, did everything that could not be done on deck, for five months, was slightly raised, so as to give more standing room, by a small deck house being built over it. Its dimensions were five feet and a half in length by five feet nine inches in breadth! A small oval table stood in the centre, a perfect little miniature stove was in one corner, a cushioned locker to sit upon ran along the fore end, and a bunk to sleep in extended along each side of the cabin. The breadth of our bed-places was one foot nine inches! Cupboards were fitted underneath the bunks, in which we stowed our wearing apparel, ammunition, natural history specimens, instruments, books, etc. Our guns and rifles, of which we had no less than eight of different descriptions, were suspended in various parts of the cabin ready for instant use.

A small window in the forepart of the cabin, and two prisms overhead, served to give us light.

Immediately before the cabin was the main hold, well stocked with barrels, which we fondly imagined we were going to bring back full of valuable oil! A small caboose, or deck galley, served as our kitchen, and this was taken possession of by Kilgallon, Sir Henry's servant, who had especial charge of the culinary department and attended generally to our wants. A more useful or willing man for such a cruise it would have been impossible to find. No matter what time we returned—and our hours were sometimes very irregular—a savoury hot meal would be ready for us, dry clothing prepared, and everything that could be thought of to render a weary man happy and comfortable would be provided. In addition to all this, the "faithful one," as he was invariably called by us, had charge of the *armament*, which was kept in the most perfect order the whole cruise.

Next to the hold was a large space fitted up with a table, lockers, and four bed-places. This was where our worthy skipper, mate, Kilgallon, and the two harpooneers lived. In the fore end of the vessel was the accommodation of the crew, which consisted of the cook and four seamen, all Norwegians.

Altogether we were rather pleased at the result of our inspection, and longed for the opportunity of testing the sea-going qualities of our little vessel and her handiness in the ice.

There were, of course, many things to be done and taken into consideration before we could be ready for sailing. All our provisions and stores had to be purchased—and here I may as well remark that, with very few exceptions, they are as easily obtainable and as cheap in Tromsö as in England—mess traps had to be provided, kitchen utensils furnished, bedding bought, and the thousand and one necessaries obtained for such a trip as we contemplated.

The previous occupants of our cabin had evidently not bestowed much trouble or time on the performance of those ablutions which we generally regard as necessary to health and comfort—no arrangements whatever having been made even for a small wash-hand basin, such as we used on board the *Lofoten!* This omission had to be duly considered, and of course rectified.

The chronometer, too, had to be rated, for notwithstanding the tender care with which it had been cherished since leaving England, its rate had been seriously affected, either by the journey or the change of temperature, and instead of behaving as a well-regulated timepiece should, it seemed only too prone to conduct itself in such an irregular manner as to be quite untrustworthy. The bad character that it then established for itself was subsequently fully borne out! Time at Tromsö is obtained twice a week, on Sundays and Wednesdays, from Christiania, by electricity.

Before leaving, it was our good fortune to meet and make the acquaintance of Captain Carlsen, the famous Norwegian navigator, a few of whose exploits I have already alluded to in previous chapters. From him we obtained much useful information, both as regarded the ice and the best localities for game. The portrait of this gallant old seaman in Payer's book is most lifelike. He still retained the wig, his best one, that he wore on that memorable journey over the ice in 1874, after the crew of the *Tegetthoff* had abandoned their ship!

Had it been possible, he would willingly have accompanied us in the *Isbjörn,* as he himself said, "in any capacity, either as skipper or harpooneer!" He was unable to conceal the poor opinion he entertained of our skipper, Jorgensen, who had had no experience in the ice, and was not even a sailor. Had we then guessed that our captain was going to be ruled and guided by the harpooneers, who were regarded as ice-pilots, a change might have been made, which would have, in all probability, produced more successful results than those that we actually achieved.

A few days before our departure, we went on board the newly arrived steamer to receive and welcome Gouch. Tremendous precautions had been observed in order to guard against the supposed ferocity of our innocent and harmless dog. We found her secured by a stout chain, which was padlocked to a bolt in the deck, in the fore part of the steamer. On her head was an enormous muzzle, and her collar was stamped with the official Custom-house seal! This could not be broken, or the dog liberated, except in the presence of the chief Custom-house officer.

The delight of poor Gouch, on rejoining her master after so many days of muzzled imprisonment, may be imagined. She was taken at once on board the cutter, nor did she have an opportunity of landing until we reached Novaya Zemlya.

We did not wish, as Britons, to sail under Norwegian colours in the *Isbjörn*, and being provided with a Royal Harwich Yacht Club ensign, we were in a position to proceed under our own national flag. The Club had done me the honour of making me an honorary member before sailing on my second Arctic expedition. We were therefore able to sail under British colours, which we hoped to be able to display where no other English flag had ever waved.

The crew of the *Isbjörn* consisted of nine souls, all, as I have before mentioned, Norwegians.

Our skipper, Jorgensen, was only captain in name, and because he was the owner of the vessel. His qualifications for the command were *nil.* He was a good fisherman, but made no pretensions to being a navigator; indeed, it is very doubtful whether he had ever seen a sextant or chronometer before we went on board. He was an intelligent old man, powerfully made, and as active as a monkey.

Next in order of rank came Sorensen, the mate, more generally called the "Styrmand"—the best and most willing hand we had amongst our crew. He was a Dane by birth, but had married a Norwegian and settled down at Tromsö. He had served in English, Russian, German, and Norwegian vessels, and had a very fair smattering of all these tongues. As he was the only man who could speak or understand English, he was therefore the principal medium of communication between ourselves, the skipper, and the crew. The Styrmand was the proud possessor of a quadrant, having passed the requisite examination to entitle him to hold a mate's certificate.

Lodovic and Ohlsen were our two harpooneers. They were fine, powerfully built men, and—that is about all that can be said in their favour! Before the cruise was over, we had come to a very decided conclusion, that we should have benefited very materially had we been deprived of the services of these two men before leaving Tromsö. They were considered to be experienced icemen, and, under this supposition, were naturally regarded as authorities on the subject. What they said was law, and even the old skipper had not sufficient pluck to appeal against their decisions, knowing full well that they would be supported by the remainder of the crew. Then came three seamen, Nicholai, Kundsen, Bosta; a youth named Gunderson, his first trip at sea; and the old cook, Johan. With ourselves, our complement amounted to a dozen.

We were not destined to take our departure from Tromsö without experiencing a little trouble with some of the members of our small ship's company. Master Bosta, for instance, took it into his head to decamp, after having had a portion of his wages paid in advance, and had actually sailed in a ship bound to the southward before his absence was detected.

The police authorities were at once communicated with, and, as the wind was light, a fast-pulling boat was despatched in pursuit. The chase proved successful; the ship was found becalmed in one of the fiords, and the delinquent was brought back, looking very unhappy and crest-fallen. His punishment was a fine of a small sum of money, to be distributed amongst the poor of Tromsö. Bosta subsequently proved one of the best seamen, and the most willing and hard-working hand we had on board, and one whose loss, knowing his usefulness, would have been seriously felt.

Nor were the crew the only people who gave us anxiety or trouble. For a day or two before we took our departure, we were informed that a certain creditor of our captain had announced his intention of seizing our vessel unless his claims were settled! This would have placed us in a very unpleasant predicament, had not our agent come forward and got us out of the scrape by saying that the *Isbjörn*, being chartered, was no longer the property of Captain Jorgensen, but was a *bonâ-fide* British vessel. How far he was right, I do not pretend to say ; for, although we had a written agreement with the owner, we had no clearance from the British Consul, nor were we legally authorized to hoist English colours. However, we carried our point, and having taken a farewell *skaal* with all our kind friends in Tromsö, who had done so much to render our visit to their town pleasant and agreeable, we weighed anchor on Sunday, the 18th of May, and sailed out of harbour.

It was not our intention to proceed far, and we anchored again about three miles from Tromsö, so as to enable one of our men, who had but recently agreed to accompany us, to bring his traps on board.

The reason for getting under weigh was that, as it was the day originally fixed for our start, we thought we had better adhere to it, whilst we were both strongly imbued with the old sailor's superstition of "Sunday sail never fail!"

The next afternoon we got fairly away, and before sunset had lost sight of the tall spire of Tromsö cathedral.

Just before leaving, a steamer arrived with our last budget of home letters, and we had the intense satisfaction of hearing of the safety of the gallant Nordenskjöld's expedition, and of the splendid success which he had achieved.

One part of the following old prediction had been verified, and we must now look forward to the latter half of the prophecy being fulfilled:

"When Nova Zembla shall be no stay
Unto those who pass to or from Cathay,
Then think strange things are come to light,
Whereof but few have had foresight."[*]

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[*] Sir Thomas Brown's Works (folio, 1686), "Certain Miscellany Tracts," Tract xii. p. 63.

CHAPTER VIII.

FIRST DAYS AT SEA.

CALM weather or head winds were our lot for some days after leaving Tromsö, making our progress necessarily slow. We seemed fated to advance but a very short distance each day, but this slow rate of progression was, in a measure, due to our preferring to make the passage by adhering to the fiords, instead of at once subjecting our little craft to the buffetings of a turbulent and tempest-tossed sea, which would have been the case had we decided upon taking what is called the outside passage.

I think, after all, our decision was a wise one, for although, perhaps, in consequence our voyage was lengthened by a few days, it allowed us to shake down comfortably on board our vessel, and enabled us to get accustomed to our rather cramped and narrow beds before being exposed to the danger of being pitched out of them.

Whilst working our way through the fiords, we experienced most capricious weather, the winds especially coming in sudden and fitful gusts. One moment we would be laying becalmed in a narrow channel, completely surrounded by hills exceeding two and three thousand feet in altitude, their snow-covered slopes and summits being clearly reflected in the smooth and unruffled water that nestled at their bases, whilst our own hull and long tapering mast appeared mirrored, as we gazed into the water, as in a looking-glass—an apt and perfect representation of Coleridge's "painted ship upon a painted ocean." The next moment we would, suddenly and almost without warning, be assailed by a strong and furious squall, which, gathering strength and velocity as it rushed through the mountain gaps and gorges, would burst upon us with such uncontrolled fury that it necessitated the greatest caution and vigilance on the part of our crew to avoid a disaster.

Before leaving Tromsö, I received a letter from Captain de Bruyne, the commander of the Dutch exploring schooner *Willem Barents,* who had very kindly sketched out for our information a rough programme of what he hoped to accomplish during the summer. The obtaining of serial temperatures, dredgings, and soundings in the Barents Sea would form the most important part of what he proposed to do, but he also gave dates when he expected to arrive at different places along the coast of Novaya Zemlya, so that we might arrange to meet, if it suited our purpose. It was not his intention to leave Holland before the first week in June. The examination of the pack in different localities and at different times was also one of the principal objects of the cruise, besides erecting memorial stones on Cape Nassau and at Ice Haven, where Barents and his sturdy followers passed the winter of 1596–97.

Shortly after our departure, it was found that all the water taken on board at Tromsö had been put into rum casks that had not been properly rinsed out! This was a dreadful discovery, and some of our men who were teetotalers put on very wry faces; for they found, to their horror, that not only were they compelled to drink grog whenever they wished to alleviate their thirst, but that they were also obliged to *wash* in it whenever they indulged in such a luxury, which however was not very often! We had no less than four, out of our small ship's company, who professed to be total abstainers, but I am rather inclined to think that half of this number gave up spirituous and strong drinks simply because they could not be obtained. The other two, however, were strict teetotalers.

The watches on board were of course arranged after the manner of the Norwegians, which is slightly different to that in vogue in English ships. The night watches are the same, but the day watches are divided into two long ones, namely, the forenoon watch from eight a.m. until one p.m., and the afternoon watch from one to eight p.m. The twenty-four hours of the day were spent by the crew equally between keeping watch and sleeping, except such time as was devoted to eating. They smoked where they pleased, be it on deck, in the hold, or in their bunks. The rations for the men consisted of salt beef three times a week, salt fish three times a week, and salt pork once. They were also given a pound of butter per man per week, and as much biscuit as they required. Coffee was served out to them four or five times a day, and invariably at the commencement or termination of a night watch. Watch was only kept when the ship was at sea, nobody dreaming of looking out when the anchor was down !

Our upper deck was anything but a convenient one for walking. The only place where exercise could be taken was in each gangway, but at sea this space was occupied by the two walrus boats, which could not be carried elsewhere, except in very smooth water, when the ship was among ice. When the boats were out, our space for recreation was limited to about the same that is allotted to the brown bears in the Zoological Gardens, or, in sailor's parlance, "three steps and overboard." When at sea, even if the space would admit of such an indulgence, walking would be almost an impossibility from the excessive liveliness of the vessel. To add to the discomforts of the upper deck, there were no less than four funnels, varying in height from two to six feet, all emitting dense columns of black smoke at the same time! This being wafted into our faces whenever we appeared on deck was decidedly objectionable; go where we would, we were certain to meet a horrid puff of sooty vapour!

The crew, although rivalling in politeness the men of the *Pinafore*—for they invariably took off their caps and greeted us in the morning with the Norwegian salutation, "Good day"—were, on the whole, a very rough and uncouth set of men, much given to that vile and very objectionable habit of expectoration.

They were also of a decidedly musical turn, and the helmsman invariably relieved the tedium and monotony of his watch by humming or chanting some very dismal and melancholy ditty. Old Jog, as we irreverently called our worthy skipper, was an exception to this rule, so far as the humming went, for during his spell at the wheel he would trill out some Norwegian melody at the very top of his voice, keeping time with his head in the most sapient manner. Although totally unacquainted with our language, he was able, before our return to Tromsö, to sing the famous "Jingo" song, which he learnt from Kilgallon, and which so took the old gentleman's fancy, that we would hear him, at all hours of the day, bawling out at the top of his voice, in the most approved fashion, although with a very strong and curious foreign accent—

"Don't want ter fecht,
But by Yingo if er do,"
Etc., etc., etc. ! !

As the steering wheel was in close proximity to our cabin, and as it mattered little to the helmsman whether it was night or day, the musical talent of our crew was not appreciated by us, nor did we derive the same pleasure from the harmony as it appeared to afford the performers.

The Norwegians are wonderfully expert in the use of a knife or an axe. Give them these tools and some wood, and they will manufacture almost anything that may be required. They rarely use a saw or a plane. Our men were no exception to this rule, and were marvellously handy with their knives, even making oars, harpoon staves, etc., with that instrument, after first cutting them out from the rough with an axe.

The scenery along the coast, as we gradually but slowly worked our way to the northward, was very similar to what we had seen further south—a succession of rugged, and in some places almost precipitous, cliffs, and high peaks whose snowy mantles rendered the sameness more complete.

Whilst becalmed one evening off the island of Soro, we went on shore in order to stretch our legs and, if possible, procure some fresh milk. Landing on the beach, we walked up to a rather tumble-down looking habitation, hardly deserving the name of a house, and which had a most deserted appearance. Without further ceremony, we pushed open the door and entered. The reason of the stillness that prevailed was obvious! Everybody was fast asleep, thus setting at defiance Shakespere's words—

"For some must watch, while some must sleep,
Thus runs the world away!"

The owner of the establishment, however, soon woke up to the fact of our unceremonious intrusion; but, far from resenting, he bade us welcome, and invited us to be seated.

We were the first Englishmen he had ever seen, and he certainly regarded us as curiosities. At first he refused to believe in our nationality, but directly he was informed that we were bound, for pleasure, to Novaya Zemlya, he was quite satisfied that we really were Britishers. He had evidently been made acquainted with the roving propensities and eccentricities of our countrymen. A few Lapps were in the house, but they were apparently very civilized ones, attired in proper Norsk costume. A herd of reindeer were grazing outside, grubbing up the scant vegetation, which was already springing up in patches where the snow had thawed.

The owner of the house was also the possessor of a few sheep, who lived in a dilapidated kind of a stable, in diminutive stalls resembling the tiniest of horse stalls, the partitions being about two feet long and one foot high, in each of which a sheep was fastened.

Having obtained a small supply of milk, which we carried away in a bucket, we hurried off to take advantage of a breeze which seemed inclined to spring up.

Saturday, the 24th of May, was loyally observed on board the *Isbjörn*. The colours were kept flying all day to celebrate the event, and her Majesty's health was drunk with all honour. Three years before, it had been my privilege to commemorate the Queen's birthday in the highest northern latitude in which that auspicious event had ever been celebrated; and this year we felt that we were the most northern subjects of her Majesty that heartily, loyally, and devotedly uttered those four words which always find a response in the heart of every true Englishman, "God save the Queen!"

On the night of the 24th, we were assailed by some furious squalls from the south-east, which made our little craft heel over in a most alarming manner, thereby demonstrating most conclusively the insufficiency of the ballast on board. It was, in consequence, considered advisable to put into Hammerfest for a further supply, and also for the purpose of replenishing our stock of water.

We arrived on the morning of the 25th, and immediately set to work to administer to our wants, not without objections being raised by our crew to working on Sunday. These, however, were overruled, as time was too precious to be wasted.

There is no doubt regarding the *trade* of the town of Hammerfest, for our olfactory organs were immediately assailed, even before we landed, not by Milton's "Sabean odours from the spicy shore of Araby the Blest," but by the same "most ancient and fishlike smell" alluded to by Shakespere in the "Tempest." I was assured, however, that what we smelt was nothing to what it would be in the summer! I can only express a fervent wish that it may never be my lot to visit Hammerfest during that season.

The following extract, culled from the "Sailing Directions for the Coast of Norway," will suffice for a description of the place. Alluding to the island on which the town of Hammerfest is situated, it says it "is barren and mountainous, totally uncultivated, without wood, except brushwood or the dwarf birch; it is what would be reckoned the very epitome of sterility and desolation by any one but a native of Finmark!"

Having taken in our ballast and water, we sailed on the following morning, and passing Fruholm Lighthouse, the most northern establishment of that kind in the world, shaped our course to the north-east.

It was a lovely morning as we passed the island of Ingö, on which the lighthouse above alluded to is situated. Everything looked bright and joyous, as we glided along through a smooth sea, impelled by a soft, fair wind. But in four short hours, a change came over the spirit of our dream. Dark clouds banked up and obscured the bright warm rays of the sun in which we had been basking, our light fair breeze freshened to a strong head gale, and the formerly smooth sea danced and tumbled us about in a manner far from pleasant. Canvas had to be reduced, and we were soon hard at work thrashing our little craft through the channel between Hielmsö Island and the mainland.

The wind still freshening, showed us very plainly that the *Isbjörn* wanted yet more ballast; so we ran into a small, narrow, and secluded fiord, called Harvo Sund, and set our crew to work to fetch off the requisite amount in the shape of large rounded pebbles.

Whilst so employed, we took a run on shore, and as we were in quest of fresh milk, entered the most pretentious-looking house, out of a number of smaller ones which comprised the fishing village of Harvö. This house was, as we rightly imagined, the residence of the *landsmand*, or magistrate. Walking in, we found two ladies, who rising, solemnly welcomed us, and bidding us be seated, resumed their own chairs and returned industriously to the needlework on which they were engaged. As we were quite unable to interchange ideas and thoughts, being ignorant of each other's tongues, the conversation was not, as may be imagined, of a very animated description, but partook essentially of the character of a Quakers' meeting. How long this state of things would have lasted it is impossible to say, but fortunately Jorgensen came to our relief, and, breaking the silence, informed us that the *landsmand* was seriously indisposed, and could not therefore see us.

This was, at any rate, a good and reasonable excuse for our departure; so, bidding our fair entertainers (?) adieu, we took our leave, and trying the next most important-looking house in the place, met with better success; for there we not only succeeded in obtaining our milk, but we were also compelled by the hospitable owner to polish off a bottle of port wine! It was no use our saying that two, or even three, glasses were sufficient; the bottle had been especially opened for us, and it would have been considered a great breach of hospitality had we been allowed to go away without finishing it.

A rather ludicrous mistake occurred here. Being desirous of seeing the church, if such an edifice existed in the neighbourhood, we made, with the assistance of my companion's book of Norwegian dialogues, the necessary inquiries.

"Oh yes," was the answer, delivered in a somewhat surprised tone, "it is next door."

"Indeed!" said we. "Can we see it?"

"Certainly," was the reply, in a still more astonished manner. So, leading the way, our host conducted us into a passage, and opening the door of a room, we reverently peered in; but instead of seeing ecclesiastical furniture, as we expected, we saw nothing but pots and pans, a large fireplace, and a buxom wench, not very scrupulously attired, superintending the cooking of some savoury mess! The mistake was soon explained, from the fact that the Norwegian words for a kitchen and a church both beginning and ending with the same letters, our pronunciation had rather failed us.

We all laughed heartily at our error, and, the bottle of port being finished, started for a ramble over the hills, before our kind host had time to open another bottle, which he seemed very much inclined to do.

The next day, the wind having moderated, we again put to sea, and passing through Magerö Sund to the southward of North Cape, emerged into the Barents Sea, and on the following day, leaving the bold and rugged coast of Norway on our starboard beam, the little cutter's head was pointed towards our true destination, Novaya Zemlya.

By passing through the Magerö Sund, we succeeded in "doubling" the North Cape in the same way that vessels passing through the Strait of Magellan are said to "double" Cape Horn.

Whilst working through the Pasanger Fiord during a dense fog, we suddenly found ourselves close under the stupendous and rugged cliffs on its eastern side. The fog had *not* cleared up or lifted, but the summits of the cliffs only were revealed to us above the fog bank, and apparently towering directly over our heads. I dare say we were really further off than we appeared to be, but it was, nevertheless, an "uncanny" sight, and the cutter was quickly put about in order to stand away from the danger, which in a few minutes was again enveloped in the thick fog.

North Cape is not, as some people imagine, on the mainland, but is one of the northern extremes of the island of Magerö. A small promontory on the same island, a few miles to the westward, is, however, situated in the highest latitude.

English tourists during the months of July and August frequently make excursions, so I am told, to the North Cape by steamer, for the express purpose of being able to say that they have burnt holes in their hats with a burning glass, by which the rays of the midnight sun have been concentrated!

Sir Hugh Willoughby in the year 1553, with his three ships, was, in all probability, the first Englishman who sailed round the North Cape, or at any rate the first who sailed to the eastward of Vardö, or Wardhuus, as it was called in those days. The cape was regarded as the most northern point of Europe proper, as distinguished from the great continent comprising both Europe and Asia.

It was so named by Richard Chancellor, who was second in command of Willoughby's expedition, and who, luckily, did not meet the same fate as his unfortunate chief.* At least, the honour of naming this headland was at the time attributed to him, the authority for which is the following extract from the journal of Dr. John Dee, written in 1577: "The North Cape was first so named by the worthy of eternall good fame and grateful memory, my derely beloved Richard Chancelor."

Stephen Burrough, however, who was the master of Chancellor's ship, also lays claim to the honour of having conferred the name on this cape; but I think, as he was only a subordinate at the time, his claims cannot be taken into consideration against those of his superior. Burrough, in his journal, written three years after the return of Chancellor, during a voyage he made to the White Sea, writes: "*May 24th*, 1556. The North Cape, which I so named the first voyage, was thwart of us." The name by which this headland was known to the Russians was "Murmansky Noss," which signifies the Nose, or Cape, of the Normans!

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* See page 12.

However, whether it received its name of North Cape from Burrough, or whether it was so called by Chancellor, we may, I think, rest contented that the appellation was undoubtedly conferred upon it by an Englishman, and therefore leave it gradually disappearing below the western horizon, as the little *Isbjörn*, gallantly breasting the billows, with her sails bellying out before a fine fair breeze, steered to the eastward, on murderous deeds intent.

CHAPTER IX.

NAMELESS BAY.

A VOYAGE in a small vessel, when extended for any length of time, must generally be attended with a certain amount of monotony, unless rapid progress in the desired direction can be made. Calms or head winds must always be regarded with impatience and disfavour.

I am afraid our first cruise at sea in the *Isbjörn*, from the time of leaving the fiord until we again had something to attract our attention and occupy our minds, was not wholly devoid of a certain feeling of *ennui*. It was almost impossible to settle down to any regular work of a serious nature, for the liveliness of our little craft so tossed and jumbled up all our ideas into incongruity, that we felt that a day's quiet and perfect stillness would be required in order to disentangle them from the unutterable confusion into which they had been churned.

Our chief occupation was watching the different specimens of the feathered tribe, as they soared over our heads, or swooped past our side to pick up some, to them, edible matter that had been thrown overboard. Several of these were sacrificed in the interest of science, and formed a nucleus to a very fair ornithological collection that we were able to bring home. Sometimes we would watch with interest that terrible sea bully, the pomatorhine skua, more generally known as the robber gull, chasing the unfortunate but graceful kittiwakes, singling out the lucky—perhaps in this instance it would be more appropriate to allude to it as the unlucky—possessor of a fish, and, swooping down upon it with rapid and fierce flight, attempt to rob it of its meal. The kittiwakes are not devoid of courage when the loss of their dinner is concerned, and they will fight long and valiantly before being robbed of their spoil, both birds uttering the most discordant screams it is possible to conceive. I must say our sympathies were invariably with the aggrieved parties. Rightly is the skua named "the robber," for, either unable or too lazy to fish for itself, it relies for its food upon what it is able to steal from smaller and weaker birds. A seal or two, and a few whales, the *Balanoptera rostrata* of Fabricius, were likewise seen, besides birds indigenous to the Arctic zone.

On the 2nd of June the sun appeared for a short time, and gladdened us by its joyous presence. It was the first time we had seen it for six days, and it was therefore all the more welcome, not only because of its warmth and brightness, but also because by it we were enabled to determine our position. Its sojourn with us was, however, but of brief duration, for shortly after the meridian altitude was observed at noon, heavy clouds banked up, a thick fog ensued, snow commenced to fall, and the sun was lost in obscurity.

There is no region in the world where changes in the weather occur more rapidly or more suddenly than in high latitudes, and where the bright sun, shining from a cloudless sky, makes everything appear joyous and blithe which before was sombre and gloomy.

No words can be more appropriate during these transient periods of sunshine, so welcome to the Arctic explorer, than those of the author of "The Skies":—

> "Yet art thou prodigal of smiles,
> Smiles sweeter than thy frowns are stern.
> Earth sends from all her thousand isles
> A shout at thy return.
> The glory that comes down from thee
> Bathes, in deep joy, the land and sea."

On the following day, a falling thermometer and a certain sharp, crisp feeling about the air were pretty sure indications that ice might be met with at any moment. The thermometer in our cabin, during the night, was as low as 37°, whilst the temperature of the air was at freezing point. A strong westerly wind, accompanied by some heavy snow squalls, was rapidly taking us towards our destination, and we were even counting by hours the time when we should first catch a glimpse of Novaya Zemlya, if not prevented by ice from approaching sufficiently near enough to sight the land. All doubts were put at rest by the appearance of ice on the 4th of June, the vessel being at the time some fifty miles from the land, and we were soon running through streams of loosely packed thin ice.

For the previous three or four days we had been considerably tumbled about by a rather rough and confused sea, and the relief that we experienced as we suddenly shot from the unruly waste of tumultuous waters, into the almost quiescent state of the ice-surrounded sea, was most remarkable. The change was so marvellously sudden that it might almost be characterized as instantaneous.

There was no longer any necessity for "hanging on by our eyelids," or for wishing that we were in possession of more than our allotted number of hands, and we could sit down to dinner in calm serenity, without expecting every moment to witness the sudden transference of our meal from the table to the deck, or into the cupboards, in which were stowed our modest kits. The pleasure and comfort derived from this change cannot be overrated; nor, indeed, do I think they can be appreciated, except by those who have experienced the delights (?) of an ocean cruise in a forty-ton cutter.

The ice which we had rather unexpectedly encountered was, apparently, of one season's formation, and had not, I think, in any way been connected with the regular pack ice in the Barents Sea. My impression at the time was, and I have had no cause to alter my opinion since, that it had been formed to the south-west of Novaya Zemlya, in the large and extensive bight bounded to the west and east by Kolguev and Waigat Islands respectively, and that it had been broken up and drifted to where we found it by the recent strong south-easterly gales experienced by us on the passage across. In some places the ice streams were sufficiently compact to form obstacles to our advance; but, as a rule, it was well loosened by the motion of the sea and rotted by rain, so that we had little difficulty in forcing our way through. In parts, where excessive pressure had been exerted, the hummocks were filled up to a great height.

We found the little *Isbjörn* wonderfully under command in navigating through the loose ice, and as handy as a little dingy; but we also found from this our first encounter with the ice, how averse our Norwegian crew were to making a close acquaintance with it—a discovery, on our part, that was only too fully corroborated by subsequent events. In justice, however, to some of the crew, I feel it incumbent upon me to state that this timidity—or shall I say prudence?—on their part when it was a question of pushing the vessel into the ice was, in my opinion, due to the utterances of the harpooneers, whose subsequent faint-heartedness has been already alluded to.

There was no doubt, however, that they did evince an extreme dislike to go into the ice; and this aversion on their part was one of the greatest difficulties we had to contend with during the whole cruise. Payer complains in the same way of his Norwegian crew in 1871, and Lamont also alludes to the same timidity or obstinacy displayed by his "sinful Norwegians."

It is only fair to those gallant and enterprising Scandinavian sailors and ice navigators who have already won their laurels as renowned explorers in the neighbourhood of Novaya Zemlya and Spitzbergen, to say that this apparent timorousness, as exemplified in the cases just quoted, is not inherent in the race, so distinguished for the production of bold and fearless seamen, but must in a measure be attributed to the want of perspicacity on our part in the selection of our crew; and also, perhaps, to their repugnance to serve under foreigners, and a consequent want of confidence in them. I should be the last to depreciate in any way the high qualities, intrepidity, and energetic daring of such gallant Norsemen as Carlsen, Tobiesen, Johannesen, Kjelsen, and a host of other famous worthies of the present day.

I only speak of our men as we found them, and I feel confident that, had it not been for our harpooneers, who acted as wet blankets to the remainder of our crew, I should have had a different story to relate. Whilst working through ice, or anywhere in the vicinity of shoal water, it was quite amusing to watch the anxious and dolorous expression which old Jorgensen's face invariably assumed. But when fairly at sea, and clear of all dangers of both land and ice, no member of our little ship's company was merrier, or apparently more happy, than our worthy skipper. Although well advanced in years, he was, as already stated, as active as a monkey, and would frequently go aloft for the express purpose of having the pleasure of sliding down the boom-topping lift or some other rope.

We found broad leads radiating in all directions, and I have no hesitation in saying that an ordinary steamer would have experienced no difficulty in penetrating this loose ice, and so reaching the shore of Novaya Zemlya. No dangers from a "nip" need have been apprehended, for the ice was composed of such soft, brashy stuff, that the greatest misfortune that could happen to a vessel from its packing closely would have been simply a besetment of a few hours, or perhaps for a day or two at the most.

A little excitement was occasioned on the evening of the 5th, whilst working up along the edge of the pack, by suddenly discovering a couple of walruses on the ice. They, unfortunately, as far as we were concerned, observed us almost as quickly as we saw them, and not being desirous of becoming more closely acquainted, dived into the water and made off, coming to the surface in order to obtain a good look at us for a few moments before taking a final farewell. On the following day my companion succeeded in shooting a large one, but before it could be harpooned, it rolled off the piece of ice on which it had been lying, and disappeared. A number of seals, the *Phoca barbata*, from eight to ten feet in length, were, however, shot, and afforded fairly good sport.

The temperature whilst we were in the ice was some three or four degrees below freezing point, and the cold, biting wind that prevailed made it keenly felt.

This breeze brought us our first visitor from the shores of Novaya Zemlya, in the shape of a beautiful little "sylvia," about the size of a wren, possessing the most brilliant blue plumage about its neck and breast. This little warbler, being blown off from the shore, fluttered around us for a few minutes, and then alighted on the bulwarks, innocently imagining it would be allowed to rest after the fatigues incidental to its long flight. But alas, poor deluded little bird! it was too rare a specimen to be allowed to depart unmolested, and, instead of receiving kind treatment and a warm welcome, it was ruthlessly attacked with a large broom, and felled to the deck with a blow sufficiently heavy to have brought down an ox! It was sacrificed in the interests of science, and its beautiful skin was added to our natural history collection. In addition to this sylvia, we obtained specimens, during the two or three days we were in the ice, of the glaucous or burgomaster gull, the beautiful ivory gull (*Pagophila eburnea*), the mallemokke or fulmar petrel (*Procellaria glacialis*), the graceful Arctic tern (*Sterna hirundo*), the loom or guillemot (*Uria Brunnichii*), the robber gull (*Stercorarius pomatorhinus*), a dovekie (*Uria Mandtii*), the black-throated diver (*Colymbus Arcticus*), and a kittiwake (*Rissa tridactyla*).

Whilst cruising about in the ice, we obtained soundings in eighty fathoms, the bottom being soft mud. From serial temperatures procured at the same time we found that the temperature of the surface water was 31°, gradually decreasing to 28·8° at the bottom.

The instruments which we used for obtaining these observations during the cruise were two "reversible thermometers," kindly supplied to us by Messrs. Negretti and Zambra, and which gave excellent results.

Our third day in the ice was a most enjoyable one in every way. Although the temperature in the evening was some degrees below freezing point, the sun was so powerful during the day that we were more inclined to complain of the heat than of the cold! The night was one of the "stillest" it is possible to imagine. The sky and water were so similar in colouring that the horizon was lost, and it was difficult to decide where the two met, so perfectly did one blend with the other. The calm surface of the sea was so smooth that it resembled a sea of quicksilver, although occasionally ruffled by some bird alighting and floating lightly on its bosom, or where a seal would disturb the prevailing tranquillity by thrusting its head through the glassy surface to gaze at us, and then quickly disappear when its curiosity was gratified. I know no time or place better adapted for that incessant, yet general, occupation of "building castles in the air" to which we are all so prone, than whilst enjoying the beauties of the midnight sun in the Arctic regions. The perfect stillness that prevails carries one away from present cares and commonplace ideas, and aids one the more readily and easily to indulge in the construction of those aerial edifices of which we are, more or less, such ardent architects.

The relief of the watch, or a report from the crow's-nest, recalls us, however, quickly to our senses, and crumbles the fabric which we have been at such pains to build up, until it dissolves and fades away in thin air.

The crow's-nest, I should here observe for the benefit of the uninitiated, is simply a wooden barrél or cask, securely fastened at the masthead, as a comfortable residence for the look-out man. As a rule, it is generally fitted with a small trap hatch at the bottom, through which entrance into the nest is effected. Ours in the *Isbjörn*, however, was slightly different, for we were compelled to clamber over its upper rim in order to get into it. It should never be unoccupied whilst the vessel is working through ice, or when in search of game, for necessarily a more extensive view is obtained from it than from the upper deck.

Shortly after midnight on the 8th we emerged from the ice, through which we had been working all the previous day, and shot suddenly into what I should feel almost inclined to call "a landwater," that is, a channel of water found during the summer between any large body of ice and the land. In this we encountered a heavy sea, and as it was blowing a fresh gale from the south-east, we knocked about considerably, our little craft displaying more liveliness than she had hitherto shown. The sudden change—for it all occurred in less than five minutes—from a perfectly quiescent sea to one in violent commotion, was as remarkable as it was disagreeable. The turbulent sea was, in itself, convincing proof, if proof was necessary, that no floating ice existed between us and the land. During the morning it blew "great guns," so that our walrus boats had to be hoisted in and secured. Snow was falling heavily, thus rendering the air densely thick. On the 9th we obtained our first glimpse of the little known land of Novaya Zemlya; the portion that we first caught sight of being the low, snow-covered coast of Goose Land. These low, flat, jutting-out peninsulas form a very peculiar feature of the otherwise bold mountainous scenery of the west coast.

As there were no indications of the gale moderating, we resolved to run in and seek shelter under the lee of the North Goose Cape; but before this intention could be carried out, the weather became so thick and dirty looking that, having struck soundings in four fathoms, the anchor was let go about a mile and a half from the shore, and we determined to await a more favourable opportunity of pushing on. The twenty-four hours preceding this event were the coldest we had experienced, the temperature ranging from a maximum of 33° to a minimum of 28°.

On the following day, the wind having abated, the anchor was weighed, the reefs shaken out, and the little *Isbjörn* was again gliding gently through the water with her head pointed in a northerly direction, with the intention of visiting a bay in the neighbourhood of Cape Britwin, which had the reputation of being a good place for looms. As large droves of these birds were seen flying past us in the required direction, we made no doubt but that we should soon obtain a goodly supply of fresh meat and eggs.

Goose Land, as I have already intimated, is low, apparently not exceeding fifty or sixty feet at its greatest altitude. The water, as might be expected from the formation of the land, is shoal; it is therefore unadvisable to approach very close. Bold and rugged ranges of hills, from five hundred to a thousand feet in height, form a background to the low shelving coast. The whole country was completely buried under its wintry coat of snow.

I cannot say that our first view of Novaya Zemlya prepossessed us very much in its favour. We felt that

> "Winter, with his naked arms
> And chilling breath, was there.
> The rills that all the autumn time
> Went singing to the sea,
> Were waiting in their icy chains
> For spring to set them free."

In spite, however, of its wintry aspect and rather dreary surroundings, it was to us a new land, and we naturally gazed upon it with great interest, taking in every cape, point, and bay as we sailed slowly past, and comparing the coast line with that delineated on the Russian chart, which we found to be, so far as we could judge, perfectly accurate and trustworthy.

A few miles south of Cape Britwin, to our intense surprise, we observed a small boat bearing down upon us from the land, its occupants firing blank charges from their guns so as to attract our attention. Many were the conjectures on board the *Isbjörn* as to what she could possibly be. Some were of opinion that she contained the crew of a shipwrecked vessel, whilst others concluded that the men in the boat were the survivors of the crew of some unfortunate craft that had been caught by the ice the previous year, and had therefore been compelled to pass the winter on the sterile and inhospitable coast of Novaya Zemlya.

Our surmises were soon set at rest; for on "heaving to," and allowing her to come alongside, we found that she was a small open boat, about eighteen feet in length, containing five Samoyeds—two men, a woman, and a couple of children. They were clad in reindeer skin coats, with hoods of the same material attached, and sealskin trowsers and boots.

They appeared very happy and merry, and boarded us in a very unceremonious manner, the two men clambering over our side, leaving the lady to make the boat fast. The latter was, however, handed up by our gallant skipper in true cavalier style, the children being treated with less ceremony; for they were summarily seized by the nape of the collar of their skin habiliments, and thus lifted bodily on board. So similarly were the men and woman clothed, that it required a very keen observer to detect the difference of sex.

Their appearance and cheerfulness entirely set at rest any idea we might have entertained regarding their being in a semi-famished or distressed condition from the want of food, or the hardships incidental to shipwreck. They spoke Russian, by which we were able to ascertain, through the medium of our mate, who understood that language, that they had passed the winter in a hut not far from where they met us, and that they were then on their way south to the Kostin Shar, to visit their friends, a settlement of Samoyeds being established in that neighbourhood. A Russian had passed the winter with them, but had been left behind in charge of the hut.*

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* In 1877 a station was founded by the Russian Government in Novaya Zemlya, to take observations for twelve consecutive months. In 1878 Lieutenant Tiaguine was appointed to this duty, and on August 15th arrived in Möller Bay, where he

They informed us that we were the first vessel they had seen since the preceding year—a piece of news that was most gratifying, for we hoped to be able to get amongst walruses and seals before they were disturbed by other hunters, and so perhaps reap a rich harvest. They also told us that the land ice in the vicinity of their winter quarters had broken up and drifted away, some eight weeks before they met us.

Our visitors remained with us for about an hour, when, after replenishing their slender stock of provisions with some bread and water, and rejoicing their hearts with a glass of *aqua vita*, they took their departure and sailed to the southward. They had in their boat four wretched-looking dogs, all equipped with harness, and the runners and frame-work of a sledge. These dogs were not to be compared in size and physique to those of the Eskimo, although bearing a very decided resemblance to them.

The Samoyeds themselves are not at all unlike the Eskimo, being of short stature and possessing the same Mongolian type of features, namely, high cheekbones and oblique-shaped eyes. Their hair is worn long and unkempt, which does not improve their personal appearance.

wintered with a party of Samoyeds, returning to Archangel in August, 1879. But the Samoyeds met by the *Isbjörn* did not belong to this party, Möller Bay being to the south of Goose Land.

On the day following the events just related, we succeeded in rounding Cape Britwin. It was in a bay near this headland that Weyprecht and Payer, with the crew of the ill-fated *Tegetthoff*, were rescued by some Russian walrus-hunters and conveyed in their vessels to Vardö.

Shortly after noon on this day, we passed a large isolated fragment of ice, the first really heavy piece that we had seen. It was lying aground in six fathoms, exposing about twelve feet above the surface of the water, so that its thickness may be very accurately estimated at about fifty feet. I am under the impression that it had originally been a portion of a Kara Sea floe, and that it had found its way to where we saw it, by drifting through the Matyushin Shar.

On the 12th of June we anchored in a large bay, distinguished on the chart by the rather negative appellation of Nameless Bay! This was where we expected to be able to replenish our fast-diminishing larder, by a visit to the "loomeries," as the breeding-places of the guillemots are called in Arctic parlance. There was no doubt about the birds being there, for as we entered the bay, they flew past us in countless numbers, going from and returning to their nests.

Hills of from eight to fifteen hundred feet in height bounded the bay on three sides, leaving the entrance open to the westward. These hills sloped down towards the water, terminating in abrupt and precipitous cliffs of limestone formation of about one hundred feet in height. Frost, and the action of the weather, had formed narrow ledges on the face of these cliffs, the ridges rising in regular stratifications, tier over tier, from about ten feet above the water to the summit. On these ledges could be seen congregated together myriads of looms, so thickly clustered that the combination of their black and white plumage made the face of the cliffs assume a "pepper and salt" hue, whilst the water was dotted with numbers of these birds feeding, and the air was so thick with them, as they flew backwards and forwards, that it reminded me more of the swarming of hundreds of hives of bees than anything else.

Never before had I ever seen such a "living mass" of the feathered denizens of the air assembled in one place. The loomeries in Greenland and other parts of the Arctic regions that I have visited cannot in any way be compared to the densely populated loomeries of Nameless Bay. The noise produced by the incessant whirr of wings, as these birds flew to and fro, resembled that of surf beating on some rock-bound coast, and was a perfect illustration of Milton's words—

> "The haunt of seals, and orcs, and sea-mews' clang."

As we pulled in, the birds, startled at our approach, flew past us in thousands, and so close that we could easily knock them down with our oars; others, in their fright, flew head downwards into the snow on the ice-foot, and then, tumbling into the water, flew away; whilst others were so tame as to allow themselves to be caught by hand.

Some idea may be formed of the countless number of these birds, when it is known that in somewhat less than a couple of hours my companion and myself bagged six hundred; and, had we required a greater supply, more could have undoubtedly been obtained in the same space of time.

On the first discharge of our guns, a perfect cloud rose in front of us, completely obscuring the face of the cliff. The sound caused by this sudden flight can only be likened to the fall of water from some gigantic cascade. As they flew outwards, they actually struck us in the boats, whilst our victims tumbled upon us like hail! We were, unfortunately, a few days too early in the season to supply ourselves plentifully with eggs. A few only were obtained. We had hoped to have been able to have provided ourselves with sufficient to last for, at least, two or three months.

The looms build their nests on the ledges, along which they sit or stand perched up like a regiment of soldiers, where their eggs, of which there is only one in each nest, are perfectly secure from the depredations of all thieves. An exception, however, must be made in favour of the glaucous gulls and skuas! These birds construct their abodes on the summits of the cliffs, immediately over the loomeries—a commanding position, whence they watch with jealous and greedy eyes the domestic arrangements of the poor loom. The male and female of the last-named bird alternately keep watch and ward over the precious egg; and woe betide the unfortunate loom who, for the sake of food or otherwise, should be allured away from its priceless treasure. The ever-watchful burgomaster, as the glaucus gull is more generally called, quickly swoops down, and, on the return of the loom, its nest is vacant and destitute!

The burgomasters bring forth their eggs at an earlier date, apparently, than the looms, for we had no difficulty, in a very short space of time, in collecting about fifty or sixty of their eggs. Three are invariably laid in the nest, but never more than two are hatched, and sometimes only one. For some time after this *battue*, we revelled on such delicacies as "loom soup," "stewed loom," "curried loom," and other ingenious methods of cooking and dishing up those birds.

The looms, during the breeding season, appear to be very pugnacious, for on several occasions at this time we witnessed a couple of these birds engaged in fierce combat one with the other. So ferocious and so intent were they on the battle that we were frequently able to approach in our boat, and, by knocking them on the head, decide the affray in a manner which they little anticipated.

During the time we were in Nameless Bay we experienced very unsettled weather. Occasionally stormy and fitful gusts would sweep up the bay, to be succeeded by a bright, still, and almost warm day. Of course we made many excursions in various directions. One lovely night we pulled up to the head of the bay. A strong wind, that had been blowing with great fury all day, had just subsided, the fierce blasts of the forenoon giving way to a perfect calm. Every cloud had disappeared from the sky, leaving a pure and spotless azure vault over our heads; whilst the sun, a great orange-coloured ball of fire, glided slowly along the tops of the distant northern hills, at an altitude at midnight of about 10°.

Slowly we passed up the bay, enjoying the scenery as we went along. The whole of the southern shore was a continuous loomery, without a break, extending for over three miles. So numerous were these birds, that it was absolutely impossible to sweep the land carefully with a telescope for reindeer, which we hoped to find, on account of the incessant flights of these looms across the field of our glass.

In some of the cliffs were large caverns, worn away by the action of the sea, whose entrances were almost blocked by enormous masses of pure white snow, whilst clusters of large translucent icicles hung pendent like stalactites from the top, forming a beautiful fringe, or fretwork, to the portals, beyond which all was wrapped in sombre gloom and mystery.

It did not require, with such novel and beauteous surroundings, a very great stretch of the imagination to fancy ourselves suddenly transported into the realms of fairyland—a feeling enhanced as the rays of the midnight sun, "bathing in deep joy" the summits of the snow-clad hills on the northern side of the bay, glittered on the icicles that adorned the mouths of the caves on the south side, from which were reflected bright and beautiful iridescent colours.

Whilst pulling lazily at our oars and enjoying the glorious scenery I have attempted to depict, we were suddenly aroused from our pleasing reverie by a sharp exclamation from one of our quick-sighted crew, who briefly ejaculated "Rhen!" This recalled us at once from dreamland, for there, sure enough, were four reindeer quietly browsing on the few patches of vegetation which here and there appeared in the long stretches of snow-covered land.

Fairyland had to be dismissed from our thoughts, the peaceful beauties of the scene had to be ignored, and the more practical and mundane work of destruction had to be considered.

They were the first reindeer we had seen, and although we were already well supplied with fresh provisions in the shape of looms, a venison haunch, or even a steak, were delicacies not to be despised.

The reindeer, in the early part of the summer, are difficult to distinguish, on account of their coats bearing such a similarity in colour to the snow, in which they are continually grubbing for food. So keen is their scent that they quickly discover the presence of moss, willow, or other vegetation under the snow, which latter is soon displaced in order to get at it.

Landing as hastily as was consistent with quietness, although this was not performed without some difficulty on account of the ice-foot we had to scramble up from the boat, and which was quite eight feet high, we started in pursuit, my companion going round one side of a knoll, whilst I went round the other. So well had we made our arrangements that my friend, who first approached within range, succeeded in shooting the entire herd, and we had the satisfaction of pulling back to the ship in the morning with the carcases of four fine bucks in our boat.

The willow (*Salix Arctica*) is the favourite food of the reindeer, and although it is currently believed that these animals feed on what is called the reindeer moss (*Cladonia rangiferina*), I was never able to detect the presence of this lichen in the contents of the stomachs of a great number that I carefully examined. I am inclined to think that Dr. Lindsay has hit the right nail on the head, when he says that the so-called reindeer moss is possibly the *winter* food of the animal; during the summer, when it is obtainable, they subsist on the dwarf willow.

Of course, in the early part of the season, before the vegetation has had time to burst out in all its autumn luxuriance, these beasts are very lean and scraggy; but in August and September they are in magnificent condition.

From the summit of a hill, whose height by aneroid was found to be eleven hundred feet above the sea level, we obtained a glorious view to seaward, and one that was most gratifying; for although our vision, at that altitude, extended to a distance of thirty-eight geographical miles, not a speck of ice was to be seen. This was most cheering, for we had fully anticipated seeing the pack before reaching the Matyushin Shar. Taking a round of angles from the summit of the hill, so as to assist in making a rough plan of the bay, we descended by the not very dignified manner of sitting down on the hard frozen snow and sliding to the bottom. It was a rapid mode of progression, though sadly injurious to our clothes.

Before leaving Nameless Bay, we were lucky enough to find the nest and eggs of the king duck (*Somateria spectabilis*), identified eggs of which bird are said to be very scarce. The nest was formed in a little hole, on a piece of marshy ground covered with moss and grass. It was eleven inches in diameter and contained five eggs.

Unlike the nests of the eider ducks, it was devoid of down, and was made simply with grass and other vegetation. The eggs were of a dirty greenish hue, but about the same size as those of the eider duck, and were perfectly fresh. A little lemming was also obtained here, and its skin added to our rapidly increasing natural history collection.

With the aid of the mate and one of the harpooneers, we were able to improvise a rough description of a dredge, made with a piece of iron, a wooden hoop, and bread bag. With this ingenious contrivance we succeeded in obtaining several dredgings along both coasts of Novaya Zemlya with very satisfactory results, although from the nature of our appliances we were unable to dredge at a greater depth than about forty fathoms.

CHAPTER X.

THE MATYUSHIN SHAR.

During our stay in Nameless Bay, we found, as we also did in other places in Novaya Zemlya, numerous traces of former inhabitants, in the shape of ruined huts, old fire-places, and fox traps, and occasionally circlets of stones, about ten feet in diameter.

The former, in all probability, owe their existence to Russian walrus-hunters and others, who have for many years visited this country periodically in pursuit of oil-yielding animals, whilst the latter are, very likely, the remains of old Samoyed encampments. These nomadic tribes frequently pass many years of their lives in the southern portion of Novaya Zemlya, in the neighbourhood of the Kostin Shar, and they possibly, at times, migrate even further north.

Cairns, the construction of which must be due to the Russian and Norwegian fishermen in their idle moments, abound along both coasts. One of these essentially Arctic landmarks adorns the summit of nearly every prominent cape, headland, or mountain. It would be an endless task for the commander of a ship sent in search of any missing expedition in the Novaya Zemlya seas, if he had to examine every cairn he saw along the coast for tidings of the missing ones. With this eventuality in prospect, the practice of erecting cairns promiscuously, without any definite object, on Arctic shores is, I think, a reprehensible one, and should be discountenanced as much as possible.

Although nearly all the cairns (and their name was legion) seen by us were carefully examined for records or other documents, we never found anything to justify our arriving at any other conclusion but that their construction was *pour passer le temps* of men who, for the time, had no other employment; in fact, our two harpooneers, who had repeatedly visited the shores of Novaya Zemlya, would frequently point out some cairn which, they averred, they had assisted in building. A great deal of driftwood is also to be found along the coast.

On the 18th of June, a light breeze springing up enabled us to take our departure from Nameless Bay, but we had not been half an hour under weigh, when—

> "Lo! by slow degrees
> Gathering, a fog made towards us dark as night.
> There was no room for 'scaping, and that mist
> Bereft us both of sight and the pure air."

But, in spite of the fog, we resolved to stand on, keeping a good look-out and occasionally getting glimpses of the land, as the thick mist at intervals rose. The coast of Novaya Zemlya is one that requires caution on the part of those navigating it, for the water is shoal off the land, and is in places made more objectionable by the presence of submerged rocks, as we soon found to our cost; for on the same evening, just as we were meditating upon the desirability of going to bed, we were alarmed by a tremendous bump and crash, which left little doubt in our minds that something untoward had occurred.

As the *Isbjörn* had only just been "put about," and was standing with her head off the shore, it did not for the moment occur to us that we had struck upon a rock. We imagined that we had run on to a heavy piece of ice, which had not been seen in time to be avoided; but a second bump, heavier than the first, quickly undeceived us, and hurrying on deck, we found our worst fears realized.

Our little vessel was hard and fast on a rock and bumping heavily. On looking over the bows an ugly sight presented itself, in the shape of a large piece of our false keel, accompanied by a whole fleet of splinters and fragments, floating alongside. Luckily for us, this was the extent of the injury, and by backing our sails we succeeded, without much difficulty, in getting the ship afloat again.

The only apparent effect of our mishap, besides the damage just alluded to, was a brief excitement and the effectual disturbance of the watch below, who came rushing on deck with most lugubrious faces, imagining the direst of evils had befallen us. As we were going between four and five knots when we struck, we considered ourselves extremely fortunate in being let off so cheaply. The loss of our little vessel, almost at the outset of our cruise, when everything was so prosperous, would have been a calamity too dreadful to contemplate. Had the weather been clear and a good look-out kept in the crow's-nest, the danger of striking would have been averted.

On the afternoon of the following day, the sun burst forth warm and bright, dispelling the dense fog in which we had been so long enshrouded, and we found ourselves a few miles south of the entrance to the Matyushin Shar. In thick or hazy weather this strait is not easy of recognition, but when clear it is not difficult to make. The Russian chart is fairly accurate. In working in to the channel, the northern shore should be avoided as much as possible, as off it there are several patches of foul ground, besides rocks just awash. In making the Matyushin Shar from the southward, a number of conspicuous pointed rocks will be seen jutting out from the south point; these may be approached without fear, as deep water surrounds them.

On the morning of the 20th of June we sailed into the Matyushin Shar, and anchored in a snug little bay on its south side, which, from the number of cairns in the neighbourhood, we named Cairn Harbour. Our reason for stopping was the necessity of replenishing our water; this was easily done from a fresh-water stream at the head of the bay.

It seemed difficult to realize that we were really in the Matyushin Shar—a locality that had always appeared to me to be almost as fabulous and out of reach as some of those mythical places visited and described by the fictitious heroes of our boyhood.

So narrow is the channel and so sharp are the windings in the Matyushin Shar, that vessels are reported as having sailed some ten or fifteen miles into the strait, when, seeing land close ahead with apparently no outlet in the required direction, the captains have come to the conclusion that they were running into some deep inlet or land-locked bay, and have, in consequence, sailed out again, in order to renew their search for the passage they were actually in.

Leaving our crew busily employed watering ship, and also "making off" * the blubber of the seals that had fallen victims to our prowess, we started off to explore the surrounding country and to search for game.

On landing, we found the snow excessively deep, and so soft that we frequently sank into it over our knees. This rendered walking a very laborious exercise. In the few bare places where the snow had thawed, the soil was of a yielding, yet tenacious, consistency, which made our progress quite as toilsome as it was when we were floundering through the deep, soft snow. Into this thick, muddy compound we would sink at every step over our ankles, each foot, every time it was raised, emerging with a loud "squelch," and with a mass of several pounds' weight of soil adhering to the boot. Ugh! the very mention of that walk, even now, makes me shudder!

After walking for about seven miles in and through this delightful stuff, we came across a herd of reindeer; and although they could hardly be termed wild, still, on account of the level nature of the valley in which we happened to be presenting no obstacle behind which we could conceal our-

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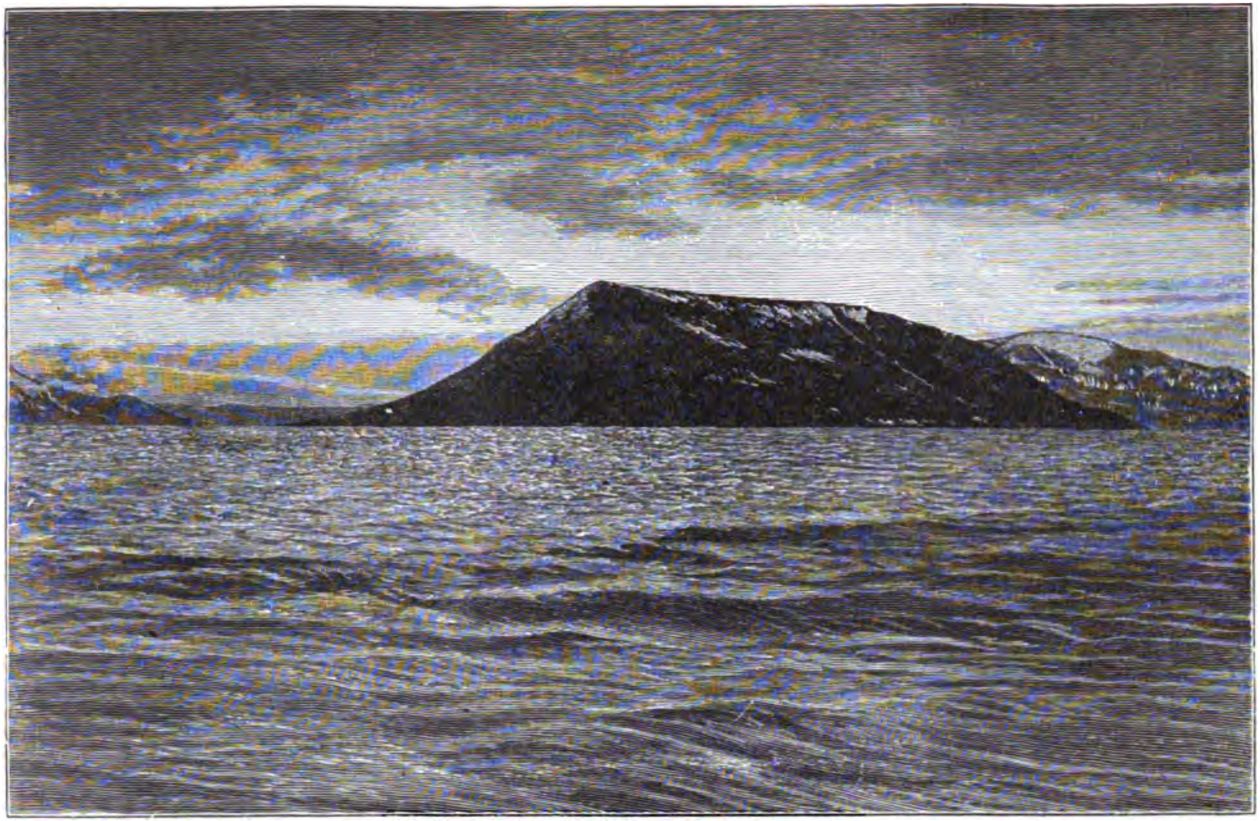
* "Making off" is the process of stripping the blubber, or fat, from the skin of the seals. It is probably derived from the Dutch word *afmaaken*, signifying to finish or complete. See my "Whaling Cruise to Baffin's Bay," page 33.



EARLY MORNING, MATYUSHIN SHAR, OPPOSITE GUBINA BAY.

selves, we had great difficulty in approaching within range. At length, after patient stalking, we got within about 350 yards of one of the herd, which we, unfortunately, succeeded in bagging.

The word "unfortunately" is here used advisedly, for, execrable as the walking undoubtedly was on the outward journey, it was infinitely worse going home, when we were carrying, in addition to our guns, ammunition, etc., the carcase of our prey—for to have left it behind would have been quite inadmissible. Such a waste of good meat, and useless sacrifice of life, would have been most reprehensible. So, putting the best face we could on the matter, and the 150 pounds of venison, equally distributed amongst three, on our backs—for Kilgallon was with us—we trudged homewards.

Ah, me! what a dreary and aggravating walk that was! My shoulders still ache at the remembrance of it.

Instead of returning to the ship by the same road that we had walked out, we took what we thought, and hoped, would be short cuts, which of course resulted, as short cuts invariably do, in longer rounds. Sometimes our way led through such deep snow that we had to scramble out of our difficulties on all-fours, only perhaps to wade through a rapid stream of water, coming not only over our boots, but up to our waists. This, with a temperature at or about the freezing point was, to say the least, extremely disagreeable; for if we stopped for a few moments to rest, as we fain would, and ease our shoulders of their burdens of solid flesh, we got so perished with the cold, that we were obliged, though sorely against our wills, to push on, in order to keep our blood in circulation.

Eventually, at about seven p.m., we reached the *Isbjörn*, wet through, cold, moderately fatigued, and very hungry, for we had eaten nothing since breakfast!

Kilgallon, with praiseworthy alacrity, soon produced some delicious venison steaks cut, in revenge, from the animal that had assisted to make us so ravenous. How they were enjoyed at dinner that evening can only be realized by those who have been placed in somewhat the same position as we had been, and who had undergone the same amount of exercise and fatigue.

In the few bare patches that we crossed during our excursion, the vegetation was struggling to force itself into notice, and with some success, for we obtained specimens of the richly coloured purple saxifrage, one of the hardiest and most common of the Arctic flora; the bright yellow-blossomed poppy (*Papaver nudicaule*); besides small tufts of the pretty little forget-me-not (*Myosotis sylvatica*).

The snow, however, as a rule, effectually concealed the luxuriant vegetation with which, at a later period of the year, the valleys were clothed.

Having constructed a large cairn, surmounted by a cross, on the western promontory of our harbour, we engraved on it, in large letters, the name "Isbjörnen." In it was deposited a record detailing our movements, as agreed upon between Captain de Bruyne (commander of the Dutch exploring schooner *Willem Barents*) and myself. He would probably visit the Matyushin Shar during the month of August. Our anchor was then weighed, and at ten o'clock at night, with a fair wind, we sailed to the eastward, hoping, though not expecting, to pass through the strait into the Kara Sea.

L'homme propose mais Dieu dispose. We had barely proceeded twelve miles, and had in fact only just sailed through the first reach, when we were stopped by a barrier of thin ice, extending right across the channel—a conclusive proof that the ice had not had time to break up, and that we were therefore too early in the season.

Seeing water beyond, we tried to convince ourselves that the strait was open to the eastward, and that there was nothing to prevent our sailing into the Kara Sea but the insignificant strip of thin ice which was then retarding our advance.

Acting on the impulse of the moment, we set to work to push the vessel through, and with the aid of poles, handspikes, and other implements we succeeded in clearing away the obstruction, and in reaching the water, but, alas! only to meet with disappointment; for after sailing a few hundred yards beyond, we arrived at a solid floe extending across the strait, and of such a thickness as to defy all attempts at penetration. All our hopes then of passing through the Matyushin Shar were, for the time, shattered!

We reluctantly confessed that we had arrived *much* too early, knowing full well that the channel is rarely free from ice before, at the very earliest, the end of July. It was only what we really expected to find, if we had been honest enough to proclaim our own convictions, so that the disappointment of failing to pass through was in consequence considerably lightened.

The scenery in this wonderfully formed channel is very grand, more especially on a bright sunny night, when the rays of the sun, at a low attitude, just tinge with a delicate roseate hue the snowy tips of the misty mountain tops.

In some places it reminded me very much of the fiords along the coast of Norway, although I think the scenery was more impressive—perhaps the perfect solitude that reigned supreme assisted materially in creating this impression. Lofty and noble-looking hills reared their crests on either side of the channel in majestic solemnity, whose slopes, covered as they were with deep snow, glistened in the continuous light of endless day, resembling vast mountains of frosted silver. Signs of the approaching summer could be observed in the sparkling course of a few small streams, as they trickled down the sides of the hills, running joyfully to the waters in which they would soon be swallowed up and lose their individual existence.

> "The stream rejoicing free
> As captive set at liberty,
> Flashing to heaven her sparkling spray
> And clamouring joyful on her way."

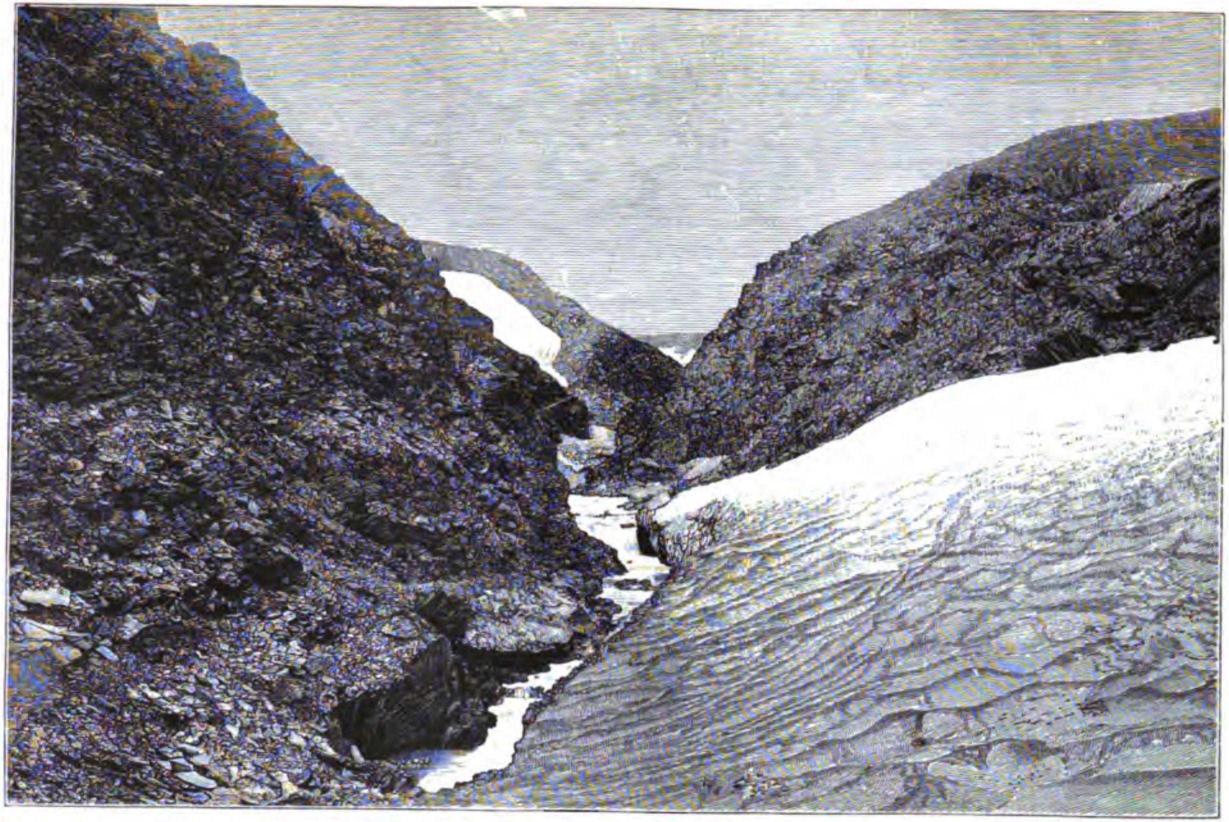
Between the ranges, undulating valleys receded from our view towards the unexplored and unknown interior, covered with such a pure white mantle of snow that all rocky projections were concealed, and they more resembled glaciers in their milkwhite opacity, than stretches of country which in a few days would be converted into verdant swards, carpeted with a rich and profuse Arctic flora.

Occasionally deep ravines, black and sombre-looking chasms, would be seen separating one mountain from another, the dark precipitous sides of which would form a striking contrast to the universal whiteness that everywhere else predominated.

We remained in the Matyushin Shar, cruising backwards and forwards between Cairn Bay and the barrier of ice that retarded our progress to the eastward for some days, hoping that perhaps a gale of wind would clear the ice away and thus enable us to proceed. No signs, however, of its disruption occurred, not even sufficient to fan the faint flicker of hope that we might have indulged ourselves with.

Our time, however, was by no means idly employed. Excursions by boat and excursions on land, with sport mainly in view, kept us fully occupied, and a great number of seals, the *Phoca barbata* and the *Pagomys fœtidus*, fell victims to the unerring aim of my companion's deadly rifle, whilst our natural history collections were largely added to, both from specimens obtained on shore, and also of marine zoology.

On one occasion I was very much interested and amused in watching the antics of a large seal, who lay basking on a piece of ice about three hundred yards from the ship. He kept rolling his ungainly carcase from side to side, sometimes turning completely round, and evidently enjoying himself hugely; yet, at the same time, we could not but help observing a certain restlessness about the creature which showed that he was warily on the alert, as if he apprehended danger lurking in the neighbourhood, for he would, every now and then, raise his head suddenly in a startled manner and gaze around,



GLADE IN MATYUSHIN SHAR.

when, as if apparently satisfied regarding his safety, he would continue his gambols. We were soon assured of his watchfulness, for on the stealthy approach of my companion, rifle in hand, on the ice, the seal was off without giving him the chance of a shot.

The Norwegian sailors declare that the seals, as they lazily recline sleeping on the ice, are carefully guarded and watched over by the burgomasters;* and that these birds perform the duties of watchful sentinels, giving due notice of the approach of an enemy. On one occasion I was placed in a position to corroborate this report.

My friend had left the ship in one of our walrus boats for the purpose of shooting a seal which was lying, apparently asleep, on the ice. Having nothing at the time better to do, I was watching from the vessel the result of his enterprise.

Before he had approached to within a hundred yards of his would-be prey, I saw a couple of glaucous gulls soaring over the animal, occasionally swooping down close to its head, as if imparting some confidential communication. Some of our Norwegians, who happened to be on deck at the time, immediately called my attention to the fact, saying that the birds were warning the animal of danger. The latter, however, did not appear to attach much importance to the warnings of his feathered friends, for all he did was to lift his head for a moment, and look round in every direction but the right one. As the boat gradually lessened the distance, the birds seemed to lose all patience, and, alighting on the ice, walked deliberately up to the seal and pecked it, as much as to say, "Now wake up, it's time to be off;" upon which the seal again raised its head, realized the danger, and suddenly diving down into its blow-hole, disappeared, sadly to the discomfiture and chagrin of my companion. I simply relate the fact as it occurred, but it was the only instance of the kind that came under my notice.

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* The glaucous gulls.

At one time much excitement was caused by a report from the crow's-nest that a bear, a veritable polar bear, was in sight. Rifles and ammunition were speedily produced, and the necessary arrangements made to give Master Bruin a warm reception; but, alas! so deceptive are distant objects in high latitudes, on approach the fierce ice-bear proved to be only a small piece of discoloured ice, and we were disappointed of the excitement of a hunt, with the prospect of possessing a nice bearskin!

But soon some nobler game was seen. A couple of large walruses were espied lazily sunning themselves on a small fragment of ice that was floating down the channel with the tide.

"A stranger animal, cries one,
Was never seen beneath the sun;
* * * *
Its foot with triple claw disjoined,
And what a length of tail behind."

A boat was immediately lowered, and, jumping into her, my companion started in pursuit. The ungainly monsters appeared by no means terrified at the approach of their enemies, but, staring vacantly around with lack-lustre eyes, appeared to be perfectly unconcerned, and quite unaware that danger was lurking in their immediate vicinity. The boat pulled up to within a few feet of the creatures, when, suddenly, a flash, followed by a quick report, and succeeded immediately by another, informed us on board that the attack had commenced. As Gore-Booth delivered his two barrels right and left, so did his harpooneer, with cunning adroitness, plunge a harpoon into each of the animals, thus securing both. By the time we arrived on the scene of action all was over! One huge monster lay stretched out on the piece of ice which, a short time before, it had selected as a comfortable bed for repose, whilst the other was hauled up, dead, alongside the boat! They were both fair-sized walruses, the tusks of one measuring twelve inches in length, while those of the other were nine inches long.*

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* The morning after this capture, we had, as a change, some walrus liver fried for breakfast, and found it excellent. Our Nor-

It is almost impossible to capture these animals with the rifle alone. Their skulls are of such great thickness that, unless hit in one particular spot, the bullet will fail to penetrate. Even if killed by the shot, the fragment of ice on which they lie, in preference to reclining on a large floe, invariably gives way in their death struggle, and the animal consequently sinks. The only sure and certain method of securing them is with the harpoon, which must be fired almost simultaneously with the shot. Both the walruses just referred to were secured in this manner.

During the time we were in the Matyushin Shar I observed what I considered a very remarkable incident, connected with the congelation of sea water. This was that "pancake ice," that is, newly made ice, was actually forming, in a certain and limited locality, on the surface of the water when the temperature of the air was as high as 39°. The temperature of the surface water was at the same time 31°. This was observed at the mouth of a large

wegian sailors were too fastidious to indulge in such a luxury. But however much they may despise the meat of the walrus, they are not above eating eggs containing well-formed chickens! Indeed, they seem to prefer them in an advanced state of incubation to being fresh, and consider them thus quite a *bonne bouche!* We also tried walrus tongue, and came to the conclusion that it *would* have been delicious if we could only have got our teeth through it, but it was as tough as boot leather. We obtained a good many of the eider duck's eggs in the Matyushin Shar.

valley, through which a great quantity of fresh water, running down the sides of the adjacent hills, was being discharged into the sea. This water, being suddenly precipitated into the sea water at a lower temperature, may account for the circumstance.

On the 21st of June the sun reached its greatest northern declination. From this date it commenced travelling to the southward, so that we might almost be tempted to proclaim that the winter was approaching before the summer had arrived! An Arctic summer is, after all, but a brief one.

Whilst in the Matyushin Shar, we heard some distinct claps of thunder. Knowing how very unusual atmospheric phenomena of this description are in high latitudes, we attributed the noise to the fall of a large quantity of snow from the summit of one of the adjacent cliffs, but subsequent reports convinced us that the noise was really due to the elements, and not to an avalanche.

On the north side of the strait I obtained a larger, and apparently a different, species of lemming * to that which I found further south. It is a curious fact that, whilst engaged in the operation of removing their skins, a very decided and unmistakable odour

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* The Novaya Zemlya lemmings all proved to be *Myodes torquatus*, but Mr. Alston says that they are much more brightly coloured than any he has ever seen, whether from Europe, Siberia, America, or Greenland.

of musk was emitted from their bodies. Whether they possess the same peculiar properties as the musk rat or not, I am unable to say. We also obtained the remains of a large fish,* apparently a herring, which a kittiwake was devouring on the ice.

As my readers may, perhaps, be a little interested in the *Isbjörn*, a brief description, at this juncture, of the appearance of our upper deck may not be amiss.

Method and neatness are virtues that the ordinary Norwegian sailors, taking our crew as typical representatives of the class, cannot lay claim to. Nothing more untidy or dirtier can be conceived than the general condition of the upper deck of our cutter during the cruise. Although this portion of the vessel was anything but extensive, it always managed to have scattered about it a large miscellaneous collection of "odds and ends;" in fact, what would come under the denomination, in nautical phraseology, of "gear."

In the fore part of the vessel, round about the step of the bowsprit, were a number of skins of birds in a semi-dried, semi-decomposed state, which the more provident of our crew were collecting in order to dispose of on their return to Norway. With what object, or for what use, they are purchased in Tromsö, I was never able to ascertain, but I think the breast feathers are used for stuffing beds and pillows. These skins lay scattered about in little heaps in various parts, according to where they were deposited to be out of the way of any work that happened to be going on on the forecastle.

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* *Mallotus villosus.*

Our chain cables—two great heaps of chain ranged on either side of the deck—slid from one side to the other every time we tacked, or when there was much motion. The little vessel was not furnished with lockers, in which these necessary parts of a ship's equipment are generally stowed.

On one side of the foremast was a greasy looking tub filled with dirty water, in which the salt fish used by our crew were invariably in soak. On the other side was, if possible, a dirtier tub, containing salted reindeer meat. Then came a barrel full of coal for present use, and a cask of fresh water, also to supply immediate wants. Abaft there were a couple of large casks of salt, and two of the seamen's chests, which might advantageously have been stowed below in the hold.

In the waist, when the boats were not stowed inboard, there was a huge clumsy block on which the firewood was cut, whilst on the opposite side was a large harness cask containing salt beef and pork.

The grindstone and tub, although in constant requisition, in spite of being useless except when acting in unison, appeared to regard each other with unfriendly feelings, for they were invariably separated and lying in different parts of the ship—as we always found out to our cost; for after barking our shins against one, in getting out of its way we tumbled over the other!

On the hatchways, in the centre of the vessel, were heaps of old rope and canvas, and storm sails, besides brooms, brushes, buckets, and swabs, which were but rarely used for the purposes for which they were intended, namely cleaning ship.

In addition to all this heterogeneous collection, haunches of venison, ducks, geese, and other birds which our men were too lazy to hang up in the rigging, might be seen lying about, whilst oilskin coats, sea-boots, mitts, trowsers, and a variety of odd-looking garments were strewn indiscriminately in various parts of the deck. On the day on which the above description was written, there was also lying in one gangway a heap of raw walrus liver, with which we hoped to allure foxes and bears to their destruction, whilst in the other gangway were the rejected contents of my dredge, a mass of mud and slime. If those who peruse this account are sufficiently *au fait* in nautical matters to be able to realize what I have attempted to describe, they will have a faint idea of the appearance of the upper deck of the *Isbjörn* on ordinary occasions. It might very justly be alluded to as the acme of dirty and slovenly untidiness.

On a small island in the centre of the channel, we found the dovekies (*Uria grylle*) breeding in great numbers. These birds make their nests, in which they lay two eggs, in the crevices and nooks of rocks and cliffs. As a rule they are almost inaccessible, being just out of arm's length. By using a pickaxe or a crowbar, they may, however, be easily obtained. The snowy owls (*Nyctea scandiaca*) were also very plentiful in the neighbourhood of the Matyushin Shar, and we succeeded in getting a very good specimen of this beautiful bird.

Our progress being checked in the Matyushin Shar, we resolved upon proceeding northwards, deferring the observations we anticipated making in the Kara Sea until a later period in the season. But bad weather and contrary winds detained us for some days, and it was not until the 27th of June that we were able to make a start and sail north along the west coast.

CHAPTER XI.

FIRST ATTEMPT TO PUSH NORTH FRUSTRATED.

A PERSISTENT head wind delayed us considerably on our passage northwards, but as we worked up close along the shore, we were all the better able to enjoy the grand scenery of the west coast, the prominent features of which were the lofty snow-clad hills in the far distance, their summits sparkling in the glorious radiance of a never-setting sun, whilst the coast itself was a succession of numerous and extensive indentations in the land, forming capacious harbours and secure and well-protected anchorages.

For some days, so persistent was the wind in its contrariness, that our normal state was one of "beating to windward," and what with a northerly current against us, and the inattention or ignorance of our helmsman, it was by no means an unusual occurrence to find ourselves on one day to leeward of the position we had gained by dint of hard struggling the previous day. Suchoi Noss, a low projecting spit of land, we found excessively difficult to weather. It always, in spite of our efforts, *would* remain to windward of us, until we were heartily tired of seeing the low barren-looking promontory. We both came to the conclusion that it would be wise for us to adopt the same method by which the ingenious Irishman contrived to drive his stubborn and obstinate pig home, namely, by pretending to want him to go in the opposite direction, for we seemed fated to experience nothing but head winds.*

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* It was, indeed, very monotonous work attempting to beat to windward in our dull-sailing craft, but it was certainly more than aggravating, when we came on deck in the morning, to find, from occasional glimpses we obtained of the land through the murky atmosphere, that we had actually lost ground during the night.

The sailing capabilities of our little vessel were of such a nature that we felt badly treated to be thus deprived of a portion of the distance that we had already accomplished after much hard striving.

It was always difficult for us to account satisfactorily for our retrogression.

Old "Jog" would, of course, ascribe it to a southerly current; but we were much more inclined to think that it was due either to careless steering, or else to the fact that our worthy skipper, the moment he got rid of us from the deck, would immediately put the vessel on the offshore tack, even though the ship's head would point in the opposite direction to that in which we wanted to go. The old fellow was never happy so long as the cutter was standing in towards the land or approaching ice, but on all other occasions he was as cheerful and as jolly as the proverbial "sand-boy." At these times his exuberant spirits would take complete possession of him, and he would dance and sing during the time he was on deck, accompanying himself on a tin dish or the bottom of a bucket.

The mate used to declare that he was not sane, and would, whilst his superior was going through these antics, point to his head and, shaking it, emphatically exclaim, "He no right here."

Our Norwegian sailors, even when their own comfort was concerned, were excessively careless. When we left Tromsö, as I have already mentioned, our fresh water had been put into spirit barrels, which consequently gave the water a groggy flavour. When we replenished our stock of water in the Matyushin Shar, it was brought off in salt barrels. The consequence was that for some weeks, until in fact we could obtain a fresh supply, we suffered from an intolerable thirst from having to drink this brackish stuff. I think the mixture first imposed upon us, namely, the groggy water, was the more preferable of the two, for in tea and coffee its flavour was lost; whereas with the salt water, although perhaps we did not actually taste it, we suffered unpleasantly from the after effects, and the more we drank the more thirsty did we become.

During the passage several serial temperatures were taken, but we were unable to discover anything that would lead us to suppose that warm currents of water existed below the surface.

As we proceeded northwards, large glaciers opened out to our view, winding their long sinuous forms between the mountain ranges; occasionally we would see two meeting round the base of a hill, where, after elbowing each other for a short distance, they would unite and flow down, in loving embrace, towards the sea as one gigantic frozen mass.

"The glacier feeds no foaming torrent there,
Endures no pale-hued flower beside its way,
But rolls between stern headlands dark and bare,
To join an ice-locked bay."

The country was completely covered with snow, which, instead of diminishing as the season advanced, appeared to increase as we reached higher latitudes.

At noon on the 1st of July we crossed the 75th parallel, and keeping away a couple of points, with a fair "fret of wind" we passed the low jutting-out spit that constitutes Admiralty Peninsula. All that we could see through the falling snow was a low flat shore, whose raised terraces were undoubted evidences of its gradual upheaval. So far we had been extremely fortunate in not meeting ice, and we felt we had reason to be thankful; for seven years before, in the neighbourhood of Admiralty Peninsula, the *Tegetthoff* was struggling through a heavy pack.

Shortly after midnight the wind freshened to a strong south-westerly gale, snow fell heavily, and the little *Isbjörn* tore along through the water at the rate of nine knots an hour. Just at this time land was sighted ahead. 'Twas an ugly peep that we obtained. Black beetling cliffs descended sheer and precipitous into the water, looming gloomy and inhospitable through the blinding snowstorm. Towards these our little craft rushed as if bent on self-destruction. Fortunately one of our harpooneers recognized the land as the southern extreme of

Berg Island, and, taking the helm, steered us safely through a channel between two islands, and into an anchorage in Lystina Bay.

The remains of a Russian hut and a cross on the south-west point of the harbour showed out prominently as we entered, and served excellently as landmarks.

We were unable to do more than just enter the little bay, which afforded us protection, on account of the land ice which was still adhering to the shore, and which extended some distance from it. This was an unpleasant, but only too certain, sign that here again we had arrived too early in the season. We felt we had for the time reached the end of our tether—a feeling that was increased by sighting to the northward the edge of the dreaded pack ice, extending from the land as far as we could see to the westward. Fixed ice connected the islands that fringe this part of the coast one with another, and also with the mainland, forming an effectual barrier to our advance. Here also for the first time did we see icebergs, but they were wretchedly small and insignificant in comparison to those grand glacial productions that are found in Davis Strait, Baffin Bay, and along the east coast of Greenland. They were scarcely more than ten, or at the most twenty, feet in height, and, except for their brilliant blue colouring, were hardly noteworthy.

From not having observed any bergs further south, we may naturally infer that either the land ice at the base of the glaciers had not broken up sufficiently to free the fragments and allow them to float away, or else that a northerly current had at once carried them off.

Although we were not more than 120 miles to the northward of Matyushin Shar, we appeared to be, so far as the appearance of the land went, at least a month earlier in the season.

There the thaw had already set in, and summer was beginning to assert itself; the land was being rapidly deprived of its wintry garb, whilst streams of water, flashing and sparkling in the sunlight, coursed down the hills to the sea—

"And, like a downward smoke, the slender stream
Along the cliff to fall, and pause, and fall did seem."

To the north, however, all was different. No gentle murmurings of freshly formed rivulets fell peacefully on our ears; all was still and silent, all one vast white world.

A few birds flapped dismally about, whilst a flock of poor wretched, frozen-out eider ducks sat disconsolately on the edge of the ice, the majority with their heads tucked under their wings, endeavouring to forget the dismal surroundings in oblivious sleep; all evidently waiting anxiously for the ice to break up and the snow to disappear, in order that they might construct their nests preparatory to enjoying the pleasures and happiness of domestic life. As I gazed upon these poor birds, I could not help recalling the words of Shakespeare in "Love's Labour's Lost :—

> "When all aloud the wind doth blow, . . .
> And birds sit brooding in the snow."

The eider ducks invariably select some low island for the purpose of building their nests and rearing their young, and they are wise enough to wait until the ice, which for seven months out of the twelve connects the islands with the main, has cleared away, so as to insure their eggs and young from the depredations of foxes, who would naturally cross over by the ice whilst foraging for a meal.

The Novaya Zemlya fox is a very shy and wary animal, and although we saw several, we were never able to obtain an adult specimen, and had to content ourselves with a couple of cubs, which, not having their hereditary sagacity and cunning fully developed, were easily shot. They do not appear to me to be the same as the true Arctic fox (the *Vulpes lagopus*), seeming to possess longer legs and ears (more resembling a wolf), and they were invariably of a mottled colour. We saw none either pure white or blue.

The hut on the point of the harbour, already alluded to, although partially in ruins, could with ease be made habitable and fairly comfortable. Materials lay around in the shape of driftwood, and all that would be required to render it a desirable residence (when the only other alternative is living without other covering than that afforded by the canopy of heaven) would be a few tools, a knowledge of how to use them, and a little energy. The hut was constructed in much the same manner as an American log hut, and was about eighteen feet square. The roof was made of lighter and smaller logs, and was also covered with a layer of pebbles. A portion of it had fallen through, and this breach we attributed to the inquisitiveness of some wandering bear. A door was on the south side of the house, and a small window in each of the other sides.

Visitors to the bay had carried out what is generally considered an essentially English custom, that of engraving their names and that of their ships on the logs of the hut. Not to be behindhand in this respect, the name of our little craft was added to the already well-cut and scribbled-over sides. The snow had drifted up round the house to the depth of four or five feet, whilst the interior was nearly full from the amount of snow that had fallen through the dilapidations in the roof.

Observing the recent tracks of a bear in the vicinity of the hut, we took on shore some walrus liver, which we burnt over a wood fire, in order that the smell might tickle the olfactory organs of some stray Bruin, and induce him to approach sufficiently near to afford us a little sport more exciting than what we had been indulging in. I doubt whether we succeeded in our murderous designs, at least so far as enticing the bears to destruction, but during the following seven or eight days, in other localities, we were fortunate enough in shooting seven bears.

On one occasion I had a capital opportunity of witnessing, unobserved, the movements of one of these animals whilst endeavouring to provide himself with a meal. I was away in the walrus boat at the time, shooting seals. Bruin was first seen advancing cautiously towards a seal that was lying on the ice, apparently asleep, about five hundred yards off. Securing the boat to the ice, we concealed ourselves in the bottom, and watched with interest the approach of the bear.

Creeping up along the ice, he gradually shortened the distance between himself and his anticipated dinner — sometimes crouching down as low as possible, and at other times breaking through the thin rotten ice and swimming for some distance in the water, occasionally swimming under water altogether.

Having approached to within about twenty or thirty yards of his intended victim, he made a savage headlong rush towards it, but only to meet with disappointment; for, quick as his movements had undoubtedly been, those of the seal were still more rapid. He vanished down his blow-hole before his aggressor had completed half the distance that separated them when he made his final charge. The bear, however, was not to be balked; so, quickly diving in after the seal, he remained searching about under water for some little time before he emerged, snapping his jaws viciously and evidently much enraged at his discomfiture. At this juncture the harpooneer who was with me began to imitate the short sharp cry peculiar to a walrus, and with such success as entirely to deceive the bear, who, pricking up his ears, quickly advanced towards us, but only to meet with a leaden messenger, which went crashing through his skull at about fifteen yards' distance.

The feathered tribe was well represented in the neighbourhood of Lystina Island. Among those seen may be mentioned the grey goose (*Anser cinereus*), the brent goose (*Bernicla brenta*), eider ducks (*Somateria mollissima*), the long-tailed duck (*Harelda glacialis*), the great northern diver (*Colymbus glacialis*), also the red-throated diver (*Colymbus septentrionalis*), looms (*Alca arra*), dovekies (*Uria Mandti*), burgomasters (*Larus glaucus*), kittiwakes (*Rissa tridactyla*), skuas (the *Stercorarius pomatorhinus*, the *S. longicaudatus*, and the *S. para-*

siticus), terns (*Sterna hirundo*), fulmar petrels (*Procellaria glacialis*), rotges (*Mergulus alle*), and ivory gulls (*Pagophila eburnea*); whilst on shore the pretty little snow bunting (*Plectrophanes nivalis*), the sanderling (*Charadrius hiaticula*), the *Tringa maritima*, and the *Alauda alpestris* were frequently seen, and tended to enliven the scene by their cheerful twittering.

Many of these birds were found breeding, and their nests and eggs were ruthlessly appropriated by us under that cloak of cruelty, the interests of science.

The ivory gulls, however, successfully baffled all our attempts to discover the whereabouts of their nests. We found the birds in very great quantities, and so close that if a seal or bear was shot on the ice, although none had previously been noticed, half a dozen of them would instantly appear and settle upon the carcase before we could approach it, yet their breeding-places could never be found. It was a curious fact that, although these birds are so plentiful in the Arctic regions, only three of their eggs have ever been discovered and brought to the notice of naturalists. One was found by Sir Leopold McClintock, on Cape Krabbé, in latitude 77° 25′, and the other two were obtained by the Swedes. With this knowledge of their scarcity, we made very strenuous exertions to find their nests, scaling precipitous cliffs and searching the country in our endeavours to obtain them, but always without success. We were, however, rewarded by finding the nests and eggs of several other birds, which, although not so valuable in a scientific point of view as those of the ivory gull, tended to enhance the value of our collection.

We found the pretty Arctic terns breeding in great numbers on a small island in Lystina Bay. They are evidently lazily inclined birds, for they do not even trouble their heads about building nests. They simply scrape a little round hole in the pebbles or shingle near the beach, in which they deposit two little eggs, of much the same colour and size as that of the plover. They invariably attract you, or direct your attention, to their nests by soaring over them and screaming in a harsh, discordant manner. The Arctic tern is an exceedingly pretty and graceful bird; its upper plumage and wings are of a delicate French grey, with a white neck and body, a forked tail, and bright red bill and legs. The island where we found these birds, to which we subsequently gave the name of Tern Island, was composed of a kind of loose friable slate, sometimes lying in horizontal and sometimes in vertical layers, according to the disintegration of the limestone formation.

On this apparently barren island I found a varied flora, although the vegetation existed only in small isolated tufts. So sparse and meagre is it, that an unobservant visitor would, most likely, walk over the entire island and declare he had seen no vestige of vegetation! I obtained about fifteen different botanical specimens from this island, but it was only by a careful and diligent search that the floral beauties could be detected and afterwards gathered.

The skuas, especially the *Stercorarius parasiticus*, behave in the most absurd and ridiculous way, when their nests are approached, in their endeavours to allure the intruder away. They roll and tumble about in the most extraordinary way, like mad or intoxicated birds; hopping about, first on one leg, then on the other, with outstretched wings, and occasionally turning round and round in the most frantic manner, and always gradually increasing the distance from their nests, uttering at the same time most piteous cries.

On one occasion, after I had possessed myself of the contents of their nests, the two birds, male and female, wreaked their vengeance on poor Gouch, who was with me, on whom they made continual swoops, much to the poor dog's alarm and disgust.

We also got a number of hauls with our dredge, with more or less valuable results.

On shore, we found the purple saxifrage growing *under* the snow, the colour showing distinctly through, and therefore resembling the so-called crimson snow of Sir John Ross. This latter, however, has been clearly proved to be due to algæ, the *Protococcus nivalis.*

Besides different kinds of saxifrages, we found, after the snow had cleared away, growing in more or less profusion, the pretty *Ranunculus nivalis*, the bright yellow-flowered *Papaver nudicaule*, the *Braya alpina*, the *Cochlearia fenestrata*, the *Draba alpina*, the *Cerastium alpinum*, the *Oxytropis campestris*, the *Taraxicum officinalis*, the *Oxyiria reniformis*, and the *Astragalus frigida*, besides numerous grasses, mosses, and lichens.

It is rather curious that whereas some of the plants which I have mentioned should have been found growing in such luxuriance, the *gentian*, one of the hardiest of Alpine flowers, equalling, even if it does not surpass, the saxifrages in numbers of species and individuals, should have been conspicuous by its entire absence from the flora of Novaya Zemlya.

During the time we remained in high latitudes, we very carefully studied and noted the effect of the wind on the weather, and, after an experience of five months, came to the conclusion that no matter from which quarter the wind blew, whether it was from the north-east or the south-west, one was just as likely to bring foggy weather as the other! Of one thing, however, we were perfectly satisfied; and that was, that so long as there was no wind at all—in other words, a dead calm—we invariably enjoyed a fine, bright, clear day, although occasionally, but very rarely, there were exceptions even to this rule. Fogs were very prevalent, and although we were in the enjoyment of "perpetual day," I should not recommend those who wish to bask in the rays of the sun to go to Novaya Zemlya! Sunshine was quite the exception with us, and was therefore all the more appreciated when it came.

Berg, Lystina, and Tern Islands were thoroughly explored by us during our stay in Lystina Bay. From the highest hill of the first-named island we obtained a good view to the northward. It was, however, by no means an inspiriting one, for it only assisted to confirm the impressions already formed of the impossibility of proceeding further in that direction; for ice, and nothing but ice, was to be seen, extending from the land to the north and to the west as far as we could see.

Notwithstanding this disheartening prospect, we were not deterred from making several attempts to push through the ice in our endeavours to reach a higher northern latitude; but our efforts were in vain, for, although the ice was of a light description, it was always too solidly packed to enable us to penetrate it. With patience and perseverance—two indispensable qualifications for an Arctic navigator—a steam vessel would, I think, have experienced little or no difficulty in forcing her way through, and thus reaching the north extreme of Novaya Zemlya; but in our little vessel, unprovided with the highly important assistance of steam, it would have been extremely imprudent to have made the attempt.

The chances of her being able to accomplish as much as a steamer would have been very small indeed, and in all probability a besetment, and that for some indefinite period, would have been the result. We could not forget that it was in the locality in which we were then attempting to force our way that the *Tegetthoff* was imprisoned in her icy bondage, from which she was not released when abandoned two years subsequently to her besetment. With such an example it behoved us to be cautious, for an imprisonment of only a few months with us would mean destruction, as we were only provided with provisions sufficient to last until September.

I cannot help here strongly entering my protest against employing vessels devoid of steam power in exploring the icy seas. At the very time when the pack is what is termed "slack"—that is to say, in a calm—a sailing vessel is helpless; and at other times, when a fair wind offers free navigation through the ice, it would be imprudent, very often, for a commander to run on, because he cannot lose sight of the fact that to extricate himself again, in consequence of a sudden change in the motion of the pack, he would have to work to windward in an ice-blocked channel.

Although it cannot but be acknowledged that most successful and important work has already been accomplished by sailing ships in the Arctic Seas, there is very little doubt that, had those vessels been steamers, a great deal more would have been achieved. If, for want of funds, it is impossible to despatch a steamer for the purpose of Arctic exploration, it is mistaken policy to send a sailing vessel for anything but a simple summer cruise.

On the morning of the 11th of July, we cast anchor off Cross Island—so named by Willem Barents in 1594, from the fact of his having found two large crosses, made from driftwood, erected on the shore. The presence of those symbols of Christianity, found at such an early period, point conclusively to the fact that the island had been discovered and visited by white men previous to its discovery by the gallant and sturdy Dutch navigator; but when, and by whom, will probably never be known.

Cross Island, it will be remembered, was the scene of the sufferings and death of the intrepid Norwegian walrus-hunter, Captain Tobiesen, in 1873, allusion to which has already been made in a former chapter.*

On landing to inspect the scene of the disaster, the first traces we met of that ghastly winter were fragments of the ill-fated *Freya*, which, with a large quantity of driftwood, lay scattered along the beach. The poor vessel herself had been so crushed by the irresistible pressure of the ice, that the largest piece of her that we could find was a portion of her bows, which lay stem downwards, with the stump of her bowsprit buried in the snow. Casks, cases, and wreckage were strewn about in all directions, whilst about four hundred yards from the *débris* stood the little house, in much the same condition as when its last occupants had left it, a silent monument of past misery.

It was a fragile-looking structure, fourteen feet in length by twelve in breadth, and seven feet high. It was not apparently so substantial or warm as the one in which that stout Hollander, Barents, passed his last winter, three hundred years before, on the same inhospitable strand.

The uprights and posts of the edifice were made from driftwood, but these were boarded over by planks obtained from the vessel. The roof was ingeniously constructed with the staves of casks, and the whole edifice was covered over with canvas.

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* See page 72.

On entering, we found the stove, with all its necessary adjuncts, such as pots, kettles, cooking utensils, etc., complete and in a very fair state of preservation; a table and a few benches constituted the furniture; but the snow had drifted into the interior to such an extent as to conceal nearly everything inside, rendering it impossible to take an inventory of the household goods, or even to ascertain whether the sleeping-places of Tobiesen, his youthful son, and the two seamen who volunteered to stand by their captain, were still in existence.

Bears, and I am afraid human beings also, had already committed sad depredations on the lonely habitation, for the canvas in many places had been cut off and carried away.

Even our men could hardly be dissuaded from indulging in the propensity for self-appropriation which these thoughtless fellows are so prone to, and it required considerable address on our parts to convince them that, perhaps, in a few days the occurrence of some dire disaster to their own vessel would make them but too thankful to accept even the poor shelter that would be afforded them by Tobiesen's house.

About one hundred yards to the northward were the graves of father and son, distinguished only by two small mounds of stones, and a few pieces of driftwood stuck upright. Nordenskjöld, the successful Swedish explorer, had caused to be placed over the last resting-place of the gallant Norwegian an inscription, in a wooden case covered with glass, but the latter had been broken, and the writing was quite illegible. I cannot ascertain whether Nordenskjöld himself had actually visited Cross Island, but I am inclined to think he never went further north along the coast of Novaya Zemlya than Matyushin Shar. The kindly act of writing and placing this epitaph was, however, attributed to Nordenskjöld by our Norwegian sailors.

Some eider ducks had built their nests under shelter of the mounds, whilst a snow bunting had selected for its domicile a snug little cavity between a couple of stones on the boy's grave. But, alas! the nest it had put together with so much diligence and care, in which to rear its youthful progeny, was destined to be its own winding-sheet and tomb; for it was found, with life extinct, at the bottom of its nest, drowned, in all probability, from the effects of a sudden thaw.

Captain Lyon in 1824, during one of his voyages to the Arctic regions, noticed an exactly similar incident.

Like ourselves, he remarked that the little snow bunting possessed all the domestic virtues and attributes of our own English robin redbreast—a bird with which it is invariably linked and associated by Arctic voyagers.

A lady, on hearing the incident related, gave poetical expression to the feelings excited by it in the following happily conceived lines:—

"Sweet bird! the breast of innocence
Hath fadeless charms for thee,
Although the spirit long hath fled,
And lifeless clay it be!

"Thou dreadest not to dwell with death,
Secure from harm or ill,
For on an infant's heart thy nest
Is wrought with fearless skill.

"And like our own familiar bird
That seeks the human friend,
Thou cheer'st the wandering seaman's thoughts
With home, his aim and end."

It was indeed a melancholy and dreary scene that we gazed upon, on that cold, cheerless July day. In the foreground were the two graves, typical of loving affection, united in life, unsevered in death; whilst immediately behind was the dismal, almost weird-looking house, resembling in its ghostly white pall of bleached canvas a large tomb or sepulchre. Around in all directions were the scattered fragments of the ill-fated schooner, emblematic of the frailty of man's works when brought into conflict with the forces of Nature. Beyond, in the far distance, was the mainland of Novaya Zemlya, fading away in a succession of snow-capped ranges, intersected by broad glaciers whose apparently smooth and regular surfaces glistened in the dull, overcast light that prevailed.

Wrought upon by the surroundings, I fancied that I could depict truthfully the sad events that had transpired in that gloomy and desolate-looking spot seven short years before.

I imagined I could see those three stalwart men, and the merry, cheerful lad, busying themselves about the necessary preparations to guard against the inclemencies of a rigorous Arctic winter. How, after the sun had disappeared, and King Frost had securely fastened his icy grip upon them, they hugged themselves round that small stove, endeavouring to obtain what warmth they could from it, as they cooked a morsel of salted bear's flesh for their midday meal. Their clothes, too, were but ill adapted to protect them from the severity of the weather and from the cold biting wind, which, despite their utmost efforts, could not be prevented from forcing its way into the frail tenement which they had hastily constructed as a protection during the long dark night.

I could easily imagine how earnestly and anxiously they looked forward to the return of the orb of day, and their joy at its welcome reappearance, as it shed its invigorating and life-preserving rays upon them, after an absence of nearly three months.

But, alas ! that joy was tinged with sorrow. For they could not disguise from themselves the mournful fact that their brave leader, who had cheered them by his merry voice and unvarying courage, was afflicted with a serious illness. Tenderly they nursed him during the spring, hoping almost against hope that the warm rays of the summer sun, which was then streaming in through the door and windows, would restore him to life and friends again. What a time of anxiety must it have been for the poor boy! Himself suffering from the same painful and loathsome disease under which his parent was rapidly sinking, yet he strove to conceal his own sickness, as he attended the death-bed of his father, until that dear one was laid in his last narrow bed, from which there is no rising except to everlasting life. This sad event occurred on the 29th of April. In nine short weeks, on the 5th of July, the lad himself was laid in the cold frozen soil, by the side of the father he had in life never deserted, nor even in the cold embrace of death! The boy's end was doubtless accelerated by the sorrow and affliction caused for the loss of his parent.

We can readily imagine, after the brief history we have rapidly sketched of the existence of this small band of men on Cross Island, the warm and fervent gratitude towards the Almighty that the two survivors must have felt when they were at last able to turn their backs on the dreary spot so fraught with sorrowful reminiscences.

Luckily, these episodes of Arctic life are of rare occurrence; but when, unfortunately, they do happen, as events of the same nature will happen all over the world, they invariably display the gallant self-denying characteristics of the man, combined with the humble trust and resignation of the Christian.

The history of Arctic adventure, although it has but few stories terminating in the same disastrous manner as the one just related, abounds with similar accounts of heroic devotion, which shed so much lustre on the history of maritime adventure.

On the beach, about two miles from Tobiesen's winter quarters, were some Russian graves, surmounted by three old crosses. They appeared to be very ancient, but could not possibly have been those after which Barents, three hundred years ago, had named the islands.

The positions of these islands on the north-west coast of Novaya Zemlya are very inaccurately laid down on the charts, not only as to their own several positions, but also with regard to their relative positions one from the other. Some of the islands are altogether ignored on the charts.

They are composed of a dark friable slate, some of them—namely, the Barents and Berg Islands—also containing strata of limestone. These strata are highly fossiliferous, abounding with mussels, crinoids, brachiopods, and even trilobites and corals. Some of the islands are composed of gneiss and other metamorphic rocks. From the specimens collected, it has now been very conclusively determined that the north extreme of Novaya Zemlya consists chiefly of carboniferous rocks, which dip beneath the sea and under Franz Josef Land in the direction of the North Pole.

So much progress has been made in the identification of Arctic fossils that the history of those northern shores is now beginning to be well known.

Failing in our repeated attempts to push northward, it was determined to relinquish, for the time, the idea of circumnavigating the north island of Novaya Zemlya, and to try instead to reach the Kara Sea again through the Matyushin Shar. The most northern position that we had then reached was latitude 76° 18′, on the 15th of July. The ice which here retarded our farther progress was pressing against the land in the vicinity of the Pankratjeff Islands. Thence it extended in a westerly direction as far as we could see. To the north was an impenetrable pack. This pack consisted of loose broken fragments of ice, varying in thickness from three to five feet. We saw no floes deserving of the name. During the month of July we experienced very heavy snowfalls.

On the 18th of July our head was pointed southwards, and on the 21st we again entered the Matyushin Shar.

It is rather a curious coincidence that, until the orders were given to steer south, we had unintentionally been following in the footsteps of Barents when he made his memorable voyage nearly three hundred years before. Not only were we adhering to his track, but the times of our arrivals at different places coincided with his dates. Thus, we sighted our first ice on the 4th of June; he did the same on the 5th. We reached Cross Island on the 11th of July; he anchored there on the 19th. On the 19th of July Barents was stopped by the ice in latitude 76° 20′, whilst we were stopped on the 15th in latitude 76° 18′. Here, however, all similarity ceases; for he, possessing more patience and perseverance than ourselves, and not having the excitement of sport in view, remained until an easterly wind blew the ice off the land, when, pushing onwards, he eventually reached Ice Haven, where he wintered.

The icebergs mentioned by Gerrit de Veer in his narrative of Barents' expedition, which were seen by him off Cape Nassau, must have drifted down from Franz Josef Land, for he mentions some of them as being over three hundred feet in thickness, and I hardly think the glaciers of Novaya Zemlya would generate such heavy ice.

CHAPTER XII.

THE KARA SEA.

WHEN we entered the Matyushin Shar for the second time, we found that a wonderful alteration had taken place in the aspect of the surrounding country since we had last seen it.

Only four brief weeks before, the land was wrapped in a great white sheet; now this had all disappeared, revealing instead long stretches of greensward carpeted with a rich and luxuriant vegetation, in which the *Draba*, *Papaver*, *Astragalus*, *Potentilla*, saxifrage, and the pretty little *Myosotis*, with many other members of the Arctic flora, some possessing delicate perfumes, clustered in rich profusion.

In the valleys herds of reindeer would occasionally be seen grazing peacefully on the abundance that surrounded them, evidently making up for lost time, and laying in a good stock of unctuous flesh before the winter should set in and deprive them of their rich pasturage.

It has always been a great puzzle to me how these animals exist during the long winter months, when the entire country is covered with snow to a depth of several feet. It is averred by some that the reindeer is able to scent the vegetation *under* the snow, which he scrapes away with his horns in order to obtain his food. But in this statement I place but little credence, as *all* vegetation fades and remains in a withered condition until the thaw enables it to receive the benefit of the sun, which soon causes it to spring up in its summer luxuriance. I am much more inclined to think that the reindeer live during the winter on the amount of fatty substance they are able to acquire in the summer, or, in other words, they hybernate. And one of my reasons for thinking so is that the first deer shot by us in the month of June were in very poor and scraggy condition, devoid of all fat. As the months advanced, so also did the fat increase on the animals, until at last it was no less than three inches in thickness on the haunch! How the members of our rich London Guilds and Companies would smack their lips over some of the haunches that were placed on our table in the little *Isbjörn!* I verily believe, if they only knew how rich and delicate were these joints, that they would at once subscribe towards defraying the expenses of an Arctic expedition, in order that others, even if they were themselves debarred from the enjoyment, might revel in the luxury of a really fine fat and juicy haunch of venison.

We were surprised and delighted at the change that had taken place in the aspect of the country, and came to the conclusion that it was the nearest approach to an Arctic paradise that it was possible to conceive, but we could not but regret its brief duration.

We knew that in six short weeks the vegetation, which was so pleasing and refreshing to the eye, would fade and die; the rivulets that sportively found their way down the slopes of the hills, meandering more peacefully along the plains until they reached the sea, would become solidified with the chilly breath of winter, and the whole country would again assume its snowy mantle; whilst the poor hardly-used reindeer would have to bear with patience and resignation the pangs of hunger, without being afforded a chance of cropping even a mouthful of the vegetation which then abounded in such profusion. The summers in Novaya Zemlya are but of brief duration, and therefore everything possessing life must necessarily make the most of its short continuance.

During one of our excursions we visited Silver Bay, which my readers will remember was so named by the Russian explorer, Ludlow, in 1807, from the quantity of talc which he discovered there, and which he at first mistook for the more precious mineral after which he called the bay. On landing, we accidentally kicked a glass bottle which was lying on the ground, half concealed by the soil and small stones that had drifted around it. To our astonishment the bottle was well corked, and contained a small strip of exceedingly dirty paper, on which was scribbled in pencil the following lines in the Norwegian language:—"Stopped here for sport in the steamer *Germania* to-day. Shot here four reindeer. —August 9th, 1871." Here followed the signatures of three of the men.

The *Germania* had been chartered for the purpose of taking the German naturalist, Von Heuglin, to make scientific researches, during the autumn of 1871, along the coast of Novaya Zemlya. The original plan, as agreed between Von Heuglin and the eminent Gotha geographer, Petermann, was for the *Germania* to visit the Obi and Yenisei rivers, whence the latter predicted that there would be little or no difficulty experienced in rounding Cape Chelyuskin, and eventually reaching the New Siberian Islands. This feat has, not many months ago, actually been accomplished by Nordenskjöld.

In August the *Germania* reached the Matyushin Shar, but was prevented from entering the Kara Sea by what was described as a wall of ice. After vain attempts to pass through, they returned south, and tried to enter the Kara Sea by the Jugor Straits; but here also they failed, the masses of ice met with being excessively heavy and in violent motion. The expedition therefore returned, though not without making very valuable scientific observations. Mr. Albert Rosenthal defrayed the expenses of this enterprise.

Near where we found the bottle was a small artificially formed mound, which appeared to be a grave; but whether it was or not we had no means of ascertaining. The country was literally teeming with animal life of various descriptions. Of quadrupeds, deer, foxes, and lemmings were abundantly plentiful. The ponds were literally crowded with geese and ducks of different kinds, whilst a stately pair of milk-white swans swam gracefully about, apparently lording it over the smaller fry. The rocks and cliffs were perfectly crowded with sea-birds, and little land birds fluttered about, apparently overcome by the onerous duties and cares of family life. I am afraid our ruthless robberies of nests and eggs brought mourning and affliction to many a light-hearted and happy couple, and made them bitterly repent the day that brought the cruel human bipeds to that lone Arctic shore, which they had selected for the purpose of rearing and educating their offspring.

Stopping only a few hours in our old anchorage in Cairn Bay, in order to take in a fresh supply of water, the anchor was again weighed, and we started, full of hope, to make our second attempt to sail through the Matyushin Shar.

The first one was made exactly a month previously, and it was therefore with a feeling of confidence that, after the lapse of four weeks of what might be considered the height of summer, we sailed to the eastward, anticipating an easy run into the Kara Sea.

But—— "Who knows what the coming hour, veiled in thick darkness, brings for us?"

To us it brought nothing but disappointment, for, sailing onward with a fine fair wind, we passed the position where, the previous month, our progress had been arrested by ice, and all looked bright and hopeful, when, on rounding the first decided promontory in the channel, we were again stopped by a barrier of ice, and one apparently of such a formidable nature as to afford us but little hope of its dispersion until a much later period in the season.

Anchoring our vessel under the lee of the point, we held a council of war as to our further proceedings, and, after reference to published authorities, we came to the conclusion that we were still *too early* in the season, the strait being rarely passable before the end of July or beginning of August, and frequently even much later. We decided, before abandoning our project of reaching the Kara Sea, to remain a few days and to devote that time to ascertaining the nature and extent of the ice that obstructed our advance.

It is never pleasant suddenly to relinquish all the hopes and anticipations on which the future has been built, and it was more especially aggravating in our case, after having been once repulsed when we had confidently made up our minds for a cruise in the Kara Sea, to be again thwarted. We felt that already the summer might almost be considered as a thing of the past, and as "sport" was really the prime object of our cruise, a determination had been arrived at to proceed to Spitzbergen, if unable to get through the Matyushin Shar, and there wage war on the walruses and seals that were reported to be in large numbers in that group of islands.

But we knew that the ice barrier which defied us was situated in the very narrowest part of the Matyushin Shar, and we therefore indulged ourselves with the belief that it was of no great extent, and that a strong breeze of wind or an unusually high tide would release it from the points of land on which it impinged, and thus set it free. A set of serial temperatures obtained in mid channel materially strengthened our hopes in this respect, for it revealed to us the important fact of the increased temperature of the water, due in a measure to the innumerable streams and rivulets that were then pouring down into the sea, which, we were aware, would in time cause the disruption and general clearance of the ice. With all these hopeful prognostications we started, as soon as possible after our little craft had been secured, to walk to the eastward along the southern shore of the channel, in order to ascertain the extent of the ice barrier.

We found the walking none of the best, for the hills had an unpleasant way of descending sheer into the water, which necessitated, if we adhered to the land, our walking along the slopes at an angle of about 25°; very good, perhaps, for a fly, but disagreeable for a human being. Huge rocks and boulders, which had to be scrambled over in the best way we could, intensified the unpleasantness of the journey. If we left the land and travelled on the ice-foot, we found the snow on its surface of such a sludgy consistency as to render the walking extremely laborious. However, there was no choice; the road was execrable; so, sometimes on the land and sometimes on the ice, we trudged onwards, our difficulties greatly augmented by the thaw, which for some days had been in rapid progress.

The ravines and watercourses were in consequence filled with turbulent streams of water, rushing uncontrollably down from the mountains. The crossing of these streams was no easy matter; sometimes we were compelled to make a long détour in order to reach a fordable place, and we were always obliged to exercise great caution in getting over.

One of these ravines was bridged over by a great mass of snow, under which the water was rushing on its swift, boisterous course. Thinking it would afford a safe and easy means of crossing, I walked over it; but my confidence was sadly misplaced, for when half-way across it gave way with a tremendous report. Fortunately I managed to scramble over to the opposite side in safety, with no further mishap than wetting my feet, but on looking behind I saw the remains of my bridge, whirled and tossed about in the seething foam, as it was rapidly carried away by the angry waters.

After a rather tedious walk of about eight miles we reached, to our great delight, the eastern limit of the ice. The water that we saw beyond flowed from the Kara Sea. Only seven or eight miles of ice separated the *Isbjörn* from that sea which we were so desirous of entering.

It was certainly very provoking that we should be stopped by such an insignificant obstruction, for the ice was of no great thickness; but feeling assured that a few days would be sufficient to effect its dispersion, we resolved upon waiting, and were well rewarded for our patience. In some parts the ice was from three to four feet in thickness, but it was considerably broken up in places, and large pools of water were being formed.

From angles that we obtained in various parts of the Matyushin Shar, we found that the Russian plan of the channel was very accurate, our bearings coinciding exactly with those on the chart; the soundings, however, we found slightly different.

On the summits of the hills on either side of the strait, and more especially on those at the heads of deep ravines or gullies, we observed regular ice-caps, or perhaps they would be better named miniature glaciers. They appeared to be formed by the excessive snowfall during the year, which, never wholly melting, is in process of time converted by pressure and partial thaw, and consequent recongelation, into ice. One of these ice-caps bore such a very decided resemblance to a glacier, that it was only after very attentive and careful observation that the land underneath could be detected.

On one occasion I was fortunately able to observe a perfect section of one of these snow accumulations. It was on the summit of a hill whose altitude was about fifteen hundred feet. The section that I saw appeared to be about twenty-five feet in height, and presented an appearance very similar to that shown by the rugged terminal edge of a discharging glacier.

During our various detentions in the Matyushin Shar, which, taken collectively, extended over a period of three weeks, we were able to determine, within a very short distance, the point of junction of the tides of the Barents and the Kara Seas. According to our observations, they met at a point near Cape Walrus, the promontory off which we were detained in the month of July. To the eastward of that cape the tide was observed to flow to the westward, whilst the ebb set in the opposite direction. West of Cape Walrus, the reverse was the case, the flood tide setting to the eastward, whilst the ebb went west.

These observations were subsequently confirmed by those of Captain de Bruyne, of the Dutch exploring schooner *Willem Barents*, whom we met a few weeks later.

We also found that where the channel was very narrow, the tide flowed with great rapidity, its velocity on some occasions being as much as 1·5 and 2 knots per hour.

The weather, during our stay in the Matyushin Shar, befriended us in a manner that, were it not for the knowledge that it was assisting very materially to clear away the ice, would not have been appreciated or regarded in such a welcome way as it was. As a rule, a strong westerly gale prevailed and a considerable amount of rain fell.

Nothing is so conducive to the destruction and general break-up of ice as wind combined with rain, although the temperature may not be very high. The swell and short sea caused by a breeze of wind will soon make a pack of not very heavy ice disappear altogether, whilst the rain falling on its surface thaws and rots it through.

We noticed that a gale of wind in the vicinity of Novaya Zemlya rarely lasted more than twenty-four or thirty-six hours at the most, except in the Matyushin Shar, where it blew continuously for many days; but this may be attributable to the high land on either side of an exceedingly narrow channel, along which the wind blew as through a funnel.

We had to exercise a great deal of patience waiting for the ice to clear away in order to allow us to proceed, but nearly every day we were enabled to advance a short distance—perhaps half a mile, sometimes less—and every night we retired to bed it was always with the firm conviction that when we arose in the morning there would be no ice in sight. During many days we were doomed to disappointment, for although perhaps able to advance a few hundred yards, we were always stopped by an effective barrier extending right across the channel. This generally consisted of loose broken-up pieces of the land floe, tightly packed together by the wind, and jammed across the narrowest part of the strait. In fact, so insignificant was the obstruction that, had we been provided with ice-saws, powder, and the necessary appliances for clearing a "nip," with a dozen willing hands, we should have experienced but little difficulty in getting through.

The gradual, but imperceptible, diminution of the ice was always a great mystery to us, and we found it exceedingly difficult even to hazard a conjecture as to what became of the fragments that must necessarily have been broken off, for none were ever seen floating past our vessel. Indeed, this would almost have been an impossibility, for the wind always blowing from the westward, the pieces of ice, in spite of the strength of the tide, would never have drifted bodily to windward; and it was equally impossible for them to have gone to the eastward, for the barrier remained stretched across the channel, and to pass the fragments would have to be taken *under* it. The only solution of the question, that I can think of, is that the broken-off pieces must have resolved themselves into their original element, and thus have disappeared and escaped our notice. The gradual decrease of the ice barrier was, as may be imagined, watched by us with intense anxiety, for we felt it was the only thing that prevented us from sailing into those "centres vast and deserts idle," which were only known to a few daring and energetic walrus-hunters, and to one or two enterprising English yachtsmen.

It was intensely provoking that we should have been immediately to the westward, and therefore to windward, of the narrowest part of the channel; for, without a shift of wind, we felt we had no chance of getting on, as all the broken-up pieces of ice were consolidated and bound together by the wind, which pressed them tightly against the barrier, thereby increasing its strength and extent. During the time we were waiting for the ice to disappear and thus allow us to proceed, we employed ourselves in exploring the country on both sides of the strait. Some of the hills were ascended, whose heights were determined by barometrical measurements at from eleven hundred to two thousand feet above the sea level; these generally gave us rather toughish climbs, for the slopes, as a rule, were covered with a kind of loose friable slate which gave way at every step. The summits were invariably covered with snow to the depth of two or three feet, which, being partially frozen, greatly facilitated our ascent, although on some we would occasionally come across soft patches into which we sank over our knees. Vegetation on the hills was very sparse, and, with the exception of a few stray tufts of saxifrage, appeared to cease altogether at an altitude of about eight hundred or one thousand feet.

These rambles were thoroughly enjoyable from the feeling of perfect solitude that they promoted. I never recollect to have felt loneliness and quietude in a greater degree than I did during some of my saunterings along the banks of the Matyushin Shar. Somehow or other there is no place that I have ever visited which, to my imagination, brings a person so prominently face to face with the wonderful works of Nature and the power of the Almighty, as the Arctic zone. And in no place are the following lines from "Childe Harold" more applicable, than to those mysterious regions, whose extent is yet unknown and unexplored—

> "There is a pleasure in the pathless woods,
> There is a rapture on the lonely shore;
> There is society where none intrudes,
> By the deep sea, and music in its roar;
> I love not man the less, but Nature more,
> From these our interviews in which I steal,
> From all I may be or have been before,
> To mingle with the universe, and feel
> What I can ne'er express, yet cannot all conceal."

At length, on the last day of July, to our intense satisfaction, we had the pleasure of witnessing the complete dispersion of the ice, and the gratification of sailing into the Kara Sea. This, however, was not accomplished without a little difficulty, and we actually had to charge and break through a small strip of ice, that would have otherwise probably delayed us for some time.

But, alas! on reaching the Kara Sea, to our great disappointment, we found it to be full of heavy ice, impinging on the points to the north and to the south, and extending as far as we could see to the eastward, in one solid impenetrable pack.

Under these circumstances it was difficult to decide upon any definite line of action. Advance in any direction seemed out of the question; in fact, the only possibility of advancing appeared to be a retreat! This sounds rather like an Irishism, but the only clear channel of water that we could see was the one we had just come through in the Matyushin Shar. We did not, however, like to own ourselves beaten, and as there was an indication of what might be termed a land water—that is, a narrow channel of water existing between the pack and the coast—to the southward, we determined upon trying to work our way in that direction, with the intention, if possible, of reaching Yelmal peninsula, which had the reputation of being a famous place for walruses.

It was certainly very provoking, just when we were congratulating ourselves upon having achieved the passage of the Matyushin Shar, to find ourselves completely checkmated by the presence of unusually heavy ice in the Kara Sea. But the exhibition of annoyance would not assist us out of our difficulties; so, putting the best face on the matter that we could, we relinquished, for the time, all idea of going north, and pointed the *Isbjörn's* head in the opposite direction.

The month of August was ushered in by one of the most charming days it is possible to conceive, and a real fine day is always appreciated in the Arctic regions. The bright sun shone down upon us out of a pure azure and cloudless sky, whilst a light southerly air, just sufficient to give our little cutter steerage way, made the *Isbjörn* amenable to command, and enabled us to work amidst and through the loose streams of ice by which we were environed the greater part of the day. We hoped, by the exercise of a little patience and perseverance, to be able to reach White Island, situated off the extreme point of Yelmal, or Samoyed peninsula, and thence we thought we should experience but little difficulty in sailing northwards in the Kara Sea, for the greater part of the ice, at such a late season of the year, would doubtless have disappeared. Thus we hoped to reach Ice Haven, and then sail round the north end of Novaya Zemlya. These were pleasing anticipations to indulge in, but, alas! as the sequel will show, they were never realized.

The ice that we met in the Kara Sea was excessively heavy, infinitely more so than what is usually seen in Baffin Bay. There are some people who, to suit their own ideas and fantastical theories, have expressed their opinions publicly that it is quite impossible for ice to be of the thickness of that seen and reported by us in the Palæocrystic Sea, during Sir George Nares's expedition, although we found perfect sections of floes exhibiting regular striations, thereby indicating their periodical growth.

They tell us, these would-be Arctic authorities, that this heavy ice is due to the fact of one floe being pressed under another, until they reach the thickness which we found them to be. Now, this elucidation of the formation of heavy ice may be very true when considered in conjunction with a chaotic mass of broken-up fragments of a floe, but it cannot be applicable to large fields of ice. Near the *Alert's* winter quarters was a floe extending in an easterly direction for seven miles, which must have been, at the least, forty feet in thickness, yet nobody in his senses would ever dream of saying that this floe was formed by the piling up of others on its surface; and this floe, it may be mentioned, was considered as being composed of really thin ice, in comparison to the heavy ice met with further north.

In the Kara Sea I had an opportunity of

measuring the height of a floe above the surface of the water, and this was by no means one of the heaviest floes that we saw. The result of my investigation was that, according to the received calculation regarding the flotation of ice, the floe was thirty-one feet in thickness, and I may as well also state that it was over four miles in diameter!

Working through loose streams of this ice forcibly recalled to my mind old encounters with the pack in other localities in the Arctic regions. The noise, too, of the water washing up against the floes, or between two fragments of ice, resembling the sound of a heavy surf beating on some rock-bound coast, was too well impressed on my memory to be easily forgotten. Occasionally a heavy crunch under the bows proclaimed that our little craft had come into contact with some partially submerged piece. Our vessel was so light that these collisions would invariably deaden her way, or even bring her to a complete standstill. These impacts, however, were of rare occurrence, for our crew was by no means desirous of making a closer acquaintance than was absolutely necessary.

But sometimes collisions were inevitable. On one occasion, whilst we were at dinner, we struck a piece with such force as to make everything dance upon our table, and cause us to rush hastily on deck, to find that the collision had had the effect of starting one of the planks immediately below the water-way. The injury sustained was trivial, but the shock to cause it must have been severe.

I must not omit mentioning a rather curious fact in connection with a bird shot in the Matyushin Shar. It was a merganser (*Mergus serrator*), the first we had seen, and it was shot by my companion with a rifle bullet. On skinning the bird, to our intense astonishment, we extracted a large shot (No. 1) from a *healed* wound in its back. This was a clear proof that the unfortunate bird had, before meeting us, already experienced the murderous propensities inherent in man! It had, in all probability, been fired at and wounded the previous year, but whether in Novaya Zemlya, Norway, Siberia, or Spitzbergen, it would be impossible to say.

Our progress south was but slow, for, in addition to the natural difficulties that we had to contend with—and they were serious enough—we also had to overcome the objections of our crew to pushing onwards, and the latter was, I think, by far the most difficult and most unpleasant work of the two. So long as either my companion or myself remained on deck, all went fairly well, and the men evinced a willingness to carry out our behests which they were, I fancy, far from feeling at heart; for, immediately we went below to retire for the night, the *Isbjörn* was steered into the nearest safe harbour, and the anchor let go!

It is hard to account for the repugnance shown by our men to risk the vessel in the ice, for the Norwegian sailors have the reputation of being brave and fearless navigators. I am rather inclined to think that when our crew engaged themselves for the voyage, they did not anticipate that one of our principal objects in undertaking the trip was that of navigating and exploring the icy seas around Novaya Zemlya. They thought that we should be quite content to secure the vessel in some snug harbour, whence our only excursions would be in boats after walruses and seals, or on land hunting reindeer. Our two harpooneers were undoubtedly the prime movers and instigators in all that affected the navigation of the ship. The poor old skipper was simply their mouthpiece, and I think he would have sacrificed a good deal to be well rid of his troublesome subordinates; but he was helpless in their hands, for when once the ship is in the ice, unless the captain is himself an experienced ice navigator, it is the custom for the harpooneers to take entire charge, and their orders are implicitly obeyed and carried out by the remainder of the crew. Our mate was, I think, the only one among the crew who saw through, and therefore despised, the harpooneers; but it was his first cruise in the ice, and, of course, he could have but little to say against the decisions of our *experienced* officers !

Our men had most marvellous constitutions for sleep, so that they were overjoyed beyond measure whenever the ship was taken into harbour, for it afforded them opportunities for indulging in a good long snooze. When once the anchor was down, all work ceased, no watch was kept, and the crew betook themselves to their bunks, in which I verily believe they would lie for weeks together, waking up only to obtain their meals.

Whilst in the Kara Sea we saw a few rotges (*Mergulus alle*), or little auks, as they are frequently called. These birds, so common in Baffin Bay and Spitzbergen, appear to be rather rare than otherwise in the Novaya Zemlya waters ; and, except in the Kara Sea, none were seen south of the seventy-sixth parallel. It is seldom they are seen at any great distance from pack ice.

It is a curious fact that we saw no kittiwakes, or mollies, in the Kara Sea, whilst ivory gulls were as numerous as we found them further north. Skuas were seen in great quantities breeding along the east coast, also the glaucous gulls and dovekies, whilst geese—both the grey goose and the brent —and many kinds of ducks were found in large flocks on the ponds.

Had we wished it, we might have shot a great number of wild fowl, but they were rather rank and coarse-eating, and not to be compared with our delicious venison, so they were, as a rule, unmolested. In addition to the birds, we saw several varieties of seals; in fact, all that frequent the coast of Greenland and seas adjacent.

The *Phoca barbata*, called by the Norwegians *stor kobbe*, were the most common; but we also saw what our harpooneers called a *blue kobbe*, which is, I think, identical with our grey seal (*Halichœrus gryphus*); also the bladder-nose seal (*Crystophora cristata*) and the Jan Mayen seal (*Phoca Grœnlandica*). These latter were so wild that they eluded all our attempts to get a shot at them. They are sometimes called the jumping, or springing, seal, from a habit they have, unlike the generality of their tribe, of jumping out of the water during their gambols.

CHAPTER XIII.

BAFFLED IN THE KARA SEA.

As we steered in a southerly direction, rigidly adhering to the land water, we had frequent opportunities of visiting the shore, which were invariably taken advantage of; and it was no uncommon thing for us to land in the early morning, directly after breakfast, and take a long and interesting ramble over the hills or along the coast, rarely returning to our little floating home until a late hour, after, perhaps, walking over thirty miles.

Although we increased our botanical collection by the addition of specimens not hitherto obtained by us, notably the *Nandosmia frigida*, the *Matricaria inodora*, the *Artemesia vulgaris*, the *Polemonium cæruleum*, and others, and although the entire country was a perfect greensward, the vegetation consisted principally of grasses and mosses, and did not appear to be so rich in phanerogamic plants as the west coast, where we found them growing in such luxuriant profusion.

The formation of the land on the east side of Novaya Zemlya we found to be vastly different from that on the opposite coast. On the east side low, undulating plains took the place of the noble hills, deep valleys, picturesque glaciers, and sombre-looking ravines for which the west coast was so conspicuous. Both, however, possess many bays and harbours, which afford good and safe refuges to vessels when threatened by the closing in of the ice, or as a haven where they may seek shelter from stress of weather.

A very peculiar and noticeable feature of the coast of Novaya Zemlya washed by the Kara Sea, is that where the land terminates in a bold cape or promontory, it is invariably steep and precipitous, although rarely exceeding in height fifty or one hundred feet. Where this occurs, there is generally a large rock or islet, some little distance from the point, which has at some not very remote period become detached from the mainland. These isolated rocks are very favourite breeding-places for the gulls and guillemots, from being inaccessible to foxes, and therefore the eggs and young birds are secured from the depredations of those thieving animals.

Some of the cliffs present an exceedingly distorted appearance, the stratifications being at all angles from the vertical to the horizontal. In some places it appears as if a sudden convulsion of nature had thrown them up, and that they had then fallen all in a heap together.

The action of the weather and the severity of the frost, and more particularly the periodical thaw of the snow, which latter accumulates on the summits during the winter, cause large portions of these cliffs to wear and crumble away; and these fragments, becoming disconnected from the parent body, form the rocks and islets just referred to.

On the 3rd of August we were compelled, on account of the pack closing, to run into Schubert Bay and anchor, so as to await a favourable opportunity for proceeding. Although the ice was pressing against the land to the southward, there appeared to be narrow channels of water leading from one into the other, in which a steamer, I opine, would experience no difficulty in pushing on; but as there was no really clear and unobstructed lead, it would have been imprudent for us in our little vessel to persevere.

Ice navigation in the *Isbjörn* was not easy, for our crow's-nest, being hardly more than thirty-five feet from the deck, scarcely gave us a range of vision sufficient to discern any of the distant leads; and when we entered one, it was quite a lottery whether it would lead to a *cul de sac*, or enable us to proceed. Besides which, the slightest obstruction in the shape of ice was so magnified by the skipper and harpooneers, that no power on earth would induce them to attempt to pass it. So far as they were concerned, the extra strengthening and doubling of our ship for ice work appeared to be a useless and unnecessary expense, for they never gave the vessel a chance of testing what she would stand in the way of a "nip." An ordinary-built English yacht would have been sufficiently strong for all the risks she would run in the ice when manned by a crew such as ours.

The more I saw of the ice in the Kara Sea, the more convinced I was that a steamer would have had little or no difficulty, provided a due amount of patience was exercised, in proceeding either north or south in the land water that existed along the coast. The pack itself, although composed of very heavy ice, was so broken up as to be easily navigable along its western edge, except when an easterly wind was blowing, when it would, of course, press against the land and form an effectual barrier to our advance.

During our stay in Schubert Bay, I succeeded in catching a number of small salmonoids, from two to four inches in length, which we found in great numbers in the rivers and ponds.

There appeared to be a paucity of organic life at the bottom in the Kara Sea, for although our dredge was in constant requisition, we were seldom rewarded by any great catch.*

The land at the head of Schubert Bay was also the only place where I saw butterflies; and here I was fortunately able to secure several different specimens. They are, I believe, the first captured and brought home from Novaya Zemlya. They were excessively wild, flew very fast, and rarely alighted, so that they were exceedingly difficult to catch. Like most things indigenous to an Arctic climate that require sun and warmth to reach maturity, they were of very small size. It is a curious fact that, although I landed several times during the month of August with the express purpose of obtaining specimens, it was only on the day above referred to that I saw any. Perhaps, for them, their summer is of brief duration, possibly not more than one day in length, and probably less than a week! Their life must indeed be short, and who can say that it is a merry one?

The remark made to me on one occasion by our mate, when the climate of the Arctic regions was being discussed, was, I think, very appropriate. In his quaint broken English he said, "For two months we no have summer, all the rest of the year is winter"—meaning that the two so-called summer months are really undeserving of the name. It was a very true remark, and may well be applied to the living world, both animal and vegetable, of Novaya Zemlya.

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* Principally Foraminifera and a few Ostracoides.

During one of my butterfly chases, and whilst I lay sprawling on the ground with my cap over my prize, preparing to transfer it to a more convenient receptacle, I happened to look up, and found myself face to face with a little fawn, who was gazing at me, I thought sadly, out of its large soft, lustrous eyes, evidently rather bewildered by the eccentric movements I had been indulging in during my hunt, and probably wondering what I could possibly be. I remained perfectly still, hoping the little animal might be so inquisitive as to approach nearer, but after regarding me attentively for about ten minutes, it suddenly appeared to realize that I was a dangerous animal, and hurriedly galloped off. As we had, the previous day, shot three deer which had a fawn in their company, but which escaped when the elder ones were killed, I should not be at all surprised if this little one was the same that had been made an orphan, and was wandering about disconsolately looking for the parents it was never again destined to see.

On the 5th, in spite of the reluctance exhibited by our men in getting the ship under weigh, we left Schubert Bay and worked our way to the southward, occasionally anchoring the ship for a few hours when the ice appeared so packed as to prevent our advance, in order that we might land and, from the top of a high hill, obtain some idea as to our prospects of pushing on.

At all these places astronomical observations for determining their positions were obtained, by which we were able to verify the admirable work of the Russian lieutenant, Pachtussof, in 1833. The extreme accuracy of his observations, and the correct delineation of his coast line, considering the circumstances under which his survey was conducted, reflect great credit on the zeal and ability of this energetic officer.

As we proceeded further south, the character of the country again assumed a different aspect. The hills became more lofty and had a more rugged appearance, and we lost the low smooth undulations which had characterized the land to the southward of the Matyushin Shar. Deep ravines intersected the various hills, discharging their contents into the numerous lakes, a chain of which run parallel to the shore.

These large ponds form a very striking feature of the coast on the east side of the island. They are invariably to be found within a short distance of the beach, and in them are to be seen the different descriptions of wild fowl peculiar to the Arctic regions, breeding in great numbers, whilst along the banks are to be found the *Tringa maritima*, the sanderling, plover, and many other small birds.

On the 5th of August the sun set a few minutes before midnight—only too ominous a sign that the navigable season was gradually but surely drawing towards its close. On this evening we anchored under the lee of one of several small islands, some of which are utterly ignored on the chart, near the entrance to Lutke Bay; but the ice driving in upon us, obliged us to weigh hurriedly and seek refuge in the harbour itself, which we found a snug and well-protected anchorage.

On the promontory forming the southern extreme of the bay, we found a large cairn about eight feet high, whilst at the head of the bay was another heap of stones surmounted by a tall Russian cross.

This bay, my readers may recollect, was discovered by Pachtussoff in 1833, and named by him after Admiral Lutke. The erection of the cross may, without a doubt, be referred to Pachtussoff, more especially as we found rudely engraved on it some Russian characters, of which the date 1833 was perfectly legible. The stones composing the cairns were entirely covered with lichen, and as we may take it for granted that the cairns were constructed at the same time that the cross was erected, we may also assume that the lichen had grown during the last forty-six years. I mention this because, during the recent Arctic expedition under Sir George Nares, some cairns were discovered by us on an island in Smith Sound, which, from the lichen that was adhering, were estimated to be of considerable age, whereas now we have conclusive evidence that it does not require any great lapse of time for the lichen to grow.

In the neighbourhood of Lutke Bay we observed the pretty little forget-me-not growing in greater profusion than any other flower. There were two distinct kinds of this plant, growing in equal abundance, the *Myosotis sylvatica* and the *Eritorichium villosum.* Their leaves are very different, one bearing a long lanceolate leaf, the other a shorter and more ovate-shaped one; whilst one grows to a height of two or three inches, the other is stunted, the flower only just peering above the leaves. The Norwegians have the same name for this beautiful little plant as we have, calling it the *Forglem-mig-ei.*

The shores along Lutke Bay were literally covered with driftwood, as indeed is the entire coast of Novaya Zemlya. No party of men who, from shipwreck or any other cause, should be doomed to spend a winter on this coast, need be under any apprehension concerning their fuel, provided, of course, a stock is laid in before the winter's snow covers the entire land.

Our stay in Lutke Bay was of some days' duration, the ice having packed itself unpleasantly close on the points both north and south of us, thereby preventing either an advance or a retreat. Our crew became a little uneasy as our prospects of making a move in either direction appeared to get smaller, and visions of abandoning the ship, or wintering in Novaya Zemlya, kept floating before their eyes.

According to Kilgallon, who, having a slight knowledge of the Norwegian language, was able to pick up occasional scraps of conversation amongst the men, they declared that they would never risk wintering, but would immediately abandon the ship, if such a proceeding in their opinion became necessary, without any previous consultation with us.

On one occasion, whilst in Lutke Bay, their desire of abandoning the ship and making a prolonged boat journey was nearly being gratified, for we had a rather narrow escape of leaving the ribs of our little vessel to mingle with the driftwood on the beach. Our anchorage was rather closer in than was perhaps prudent.

On the night of the 9th of August, a heavy gale of wind, accompanied by very strong squalls, sprang up, blowing dead on the shore, which latter was not more than our own ship's length off. At midnight, a stronger gust than usual struck the ship, which, howling and whistling through the rigging, caused us to go on deck, as we were naturally anxious regarding the safety of our vessel, whilst in such close proximity to the shore.

No signs of life were visible on the upper deck —not a soul was stirring—and, in spite of the precarious position of the ship, no watch had been set. On dropping the lead over the stern, we found, to our horror, only eight feet of water, the *Isbjörn* at the time drawing seven and a half feet. The cable was taut out ahead, and we were so close to the beach that we could with ease have pitched the proverbial biscuit on it. The squalls at this time were coming down fast and furious, the sea had risen, and the cutter was pitching unpleasantly in it. How it was our stern did not bump as each wave receded is a mystery beyond my comprehension.

Quickly arousing the crew, who, it must be acknowledged, when they perceived a real and palpable danger, were not long in responding to the call, we hove off a short distance to our anchor; then, dropping the second one, veered out on both cables to the same scope or drift that the vessel had been previously riding to. To have given her more cable was quite out of the question, for had we veered a fathom or two more, we must inevitably have struck. No sooner were the cables secured and the ship in comparative safety, than down went our crew to finish the sleep from which they had been aroused, leaving the deck as deserted as it was before they were disturbed. By three a.m., however, the wind subsided, and, slightly shifting its direction, left us in moderate safety.

Lutke Bay is a very extensive one, and on either side it has a succession of the most perfect land-locked little harbours it is possible to imagine. The water shoals considerably towards the head of the bay, until it becomes quite impassable for even a light draught boat, ending in a flat, broad, shallow delta. Beyond this was one of the most fertile-looking valleys we had yet seen, the soft greensward over which we walked yielding to our tread like thick velvet, whilst flowers of the brightest colours lay around us in rich profusion. Here we found the *Braya alpina*, the *Silene acaulis*, *Polemonium humile*, *Artemesia vulgaris*, and others.

Whilst busily engaged collecting these flowers, we observed a couple of young foxes looking attentively and inquisitively at us. Poor little animals! they paid dearly for their temerity and curiosity, for my companion's rifle was quickly at his shoulder, and a leaden messenger put an end to their inquisitiveness and existence at the same time, their skins being required to swell our natural history collection. We also saw two other cubs, but the full-grown foxes were, fortunately for themselves, away. They had selected a charming situation for their residence; their holes, of which there were many, being surrounded by flowers of the most brilliant hues, whilst a sparkling little rivulet meandered along the side of the bank into which they had burrowed.

A deer shot by us on this occasion had five enormous excrescences on its head and neck, which we supposed to be warts. Those on the neck were as large as a man's fist, and hung loosely, being connected only by a thin strip of skin. The flesh of this animal was as good as any other obtained.

During the time we remained cruising in the Kara Sea a great many seals were shot, but very few were actually secured, on account of the animals sinking before the boats had time to pull up and transfix their bodies with a harpoon, which is the only method by which a seal shot in the water can be obtained.

The Norwegian walrus-hunters declare that, during the month of August, in what they call their *Hund dags*—a time which, I suppose, corresponds to our "Dog days"—it is almost impossible to pick up a seal in the water after being shot, although perhaps killed within a few feet of the boat, so quickly do they sink. Our experience certainly tends to corroborate this assertion; for whereas in June and July, and later on in September, it was quite exceptional to lose a seal by sinking after being shot, the reverse was the case during the month of August, when very few indeed were secured.

It was exceedingly difficult to come to any satisfactory conclusion regarding the movement of the pack in the Kara Sea, for its motion was almost imperceptible. The loose straggling pieces of ice, which are always to be found skirting the edge of a heavy pack, had, however, a decided motion; but these, in all probability, being of less immersion than the main body, were more influenced by tides and surface currents. From the few observations we were able to make regarding the tide, we concluded that the flood set northward, and was much stronger than the ebb, or south-going one. The opportunities we had, however, for observing the strength and direction of the tides were very poor ones, and I can place but little reliance in them.

On the 10th of August, a lead of water appearing off the point of land to the southward, we quickly got under weigh to take advantage of it, but found the water so shoal, varying from six to twelve feet, that it was only by careful navigation, and by taking the precaution of sending a boat ahead to sound, that we succeeded in rounding the promontory. The pack itself was rather less than half a mile off the land. A ship, therefore, drawing more water than the *Isbjörn*, would have had to suffer a longer detention, in order to enable her to proceed.

After all, a small vessel does possess a few, though very few, advantages over ships of greater draught.

Our voyage was not destined to be a long one, for on the same evening we found the ice to be so closely packed off Cape Hessen as to render hopeless any idea we might have entertained of advancing. With a steamer, and patience, we might have succeeded; without either, we felt we could do but little more, and therefore ran into a small bay, which, having no name on the chart, we called Lissadell* Harbour. Here we remained for four days, when we finally decided that, with our unwilling crew, it would be unwise to persevere in our intention of going south. The difficulties that we had to contend with in order to make progress to the southward, and the little prospect that there was of obtaining game in that direction, were, we thought, hardly "worth the candle;" besides which, a great loss of time would have been incurred.

Young ice was already forming on the surface of the water, which, as we sailed through, caused a clearly defined canal to be made in our wake. This was an unmistakable sign, and one not to be lightly neglected, that we had nearly reached the end of our tether in these waters. The existence of the short Arctic summer was rapidly drawing to an end, and winter, a cold, cheerless winter, with its dread inhospitable grasp, we knew would soon claim the surrounding land and sea, and freeze it all up into one solid continent.

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* The seat of Sir Henry Gore Booth in Sligo.

> "O the long and dreary winter,
> O the cold and cruel winter!
> Ever thicker, thicker, thicker,
> Froze the ice on lake and river;
> Ever deeper, deeper, deeper,
> Fell the snow o'er all the landscape."

We felt, indeed, that "winter, with his naked arms and chilling breath," was upon us.

Under these circumstances, and taking all *pros* and *cons* into consideration, it was decided to return to the Matyushin Shar. The distance that we had made to the southward was only sixty geographical miles, and it had taken us exactly sixteen days to accomplish.

During the time we were in the Kara Sea, we enjoyed the most delightful weather, in spite of the reputation which it had earned for itself as being a locality where fogs and gales of wind prevailed. It is true we were occasionally subjected to the annoyances of a hard blow and thick weather, but these drawbacks to work and pleasure were quite exceptional, and were but few and far between.

By a curious coincidence, whilst collecting firewood on the beach at Lissadell Harbour, a piece of wood was picked up that originally formed part of a ship's furniture. It was immediately recognized by one of our harpooneers as having been fashioned by him whilst serving in a Vadso ship five years ago, and which he remembered to have been lost during the cruise the same year, somewhere between the Matyushin Shar and Burrough Strait. I relate this incident for what it is worth. The harpooneer could have no object in inventing the story; so, in all probability, it is a true one.

The time we were detained in Lissadell Harbour was not unprofitably spent, for the coast was surveyed, both by land and by water, to a distance of thirteen miles to the southward, whilst the surrounding country was thoroughly explored.

My companion, as keen and successful a fisherman as he was a hunter after larger game, was fortunate enough to kill no less than twenty-two char (*Salmo alpinus*) * in a lake near the anchorage, whose embouchure was on the beach leading into the sea.

These were, I believe, the first fish ever killed with a fly in Novaya Zemlya. They varied from two to fourteen pounds, and yielded a total weight of 110 pounds.

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* The Novaya Zemlya char is sufficiently abundant to employ the crews of a number of Russian vessels. They differ slightly from the *S. alpinus* found in Lapland and Iceland.

One of them broiled over the embers of a driftwood fire made an excellent repast, and tasted as well, if not better, than if cooked and dished up with all the appliances of a well-appointed *cuisine* at command. Perhaps hunger was the sauce that made them so appreciated, but they were certainly, whether cooked on shore or on board, uncommonly good eating.

One of our men, stimulated by the success of my companion, determined also to exhibit his piscatorial prowess; and with nothing but a long pole, to the end of which was attached about three fathoms of stout cord or white line, with a large hook affixed to the end, he started for the lake. Strange to say, with this primitive and impromptu fishing tackle, he actually succeeded in landing a couple of fish of from three to five pounds in weight! The operation of landing the fish was most amusing to us spectators. There was not the slightest attempt at "playing" the fish—it would have been impossible, with such fishing gear, to have done so; but directly the prey was hooked, it was, much to its surprise and disgust, jerked out of the water, when the enthusiastic follower of Izaak Walton immediately fell upon and lay sprawling over it in his endeavours to prevent it from jumping back into its native element.

Our friends at home little thought we were, during the month of August, living so luxuriously that venison and salmon were the ordinary dishes to be found on our table.

Little of importance occurred on our passage back to the Matyushin Shar, with the exception, perhaps, of the *Isbjörn* again grounding on a shoal; but she was fortunately got off without injury, and without much difficulty. This shoal, having no existence on the chart, was named "Kilgallon Shoal," after our faithful and hard-working attendant.

We found the land water more extended, and the ice decidedly looser, than when we went south. This is sufficiently proved by the fact that it only took us three days to sail back the same distance that had before occupied us sixteen days. From the top of Cape Galla we obtained an extensive view to the eastward and northward, which only confirmed our preconceived opinion that a steamer would have little difficulty in penetrating through the pack in either direction, for the ice appeared to be loose, and broad streams of water radiated in all directions. But nothing is more uncertain than ice navigation. At one moment everything is *couleur de rose*, and the sanguine ones imagine they are going to achieve all sorts of wonderful feats; but the next, a grand transformation scene takes place; ice, and nothing but ice—heavy, massive, and impenetrable—is to be seen, and those who were indulging in hopeful anticipations find that they were living in a "fool's paradise," and are consequently, by contrast, plunged into the lowest depths of despondency.

Whilst in the Kara Sea, we saw a number of great northern divers. These birds make a most hideous and unearthly noise; commencing first with a kind of low, mournful wail, and ending with a sound resembling somewhat the frantic shrieks of an infuriated child, alternating with the hoarse shoutings of a man. Although these birds were breeding along the coast, we never succeeded in getting their eggs or their nests, though many of the latter of the previous year's construction were found.

At this time the little *Isbjörn* was in anything but a sweet state, in consequence of the amount of blubber that we had on board, stowed in barrels in the hold, which was in a more or less advanced stage of decomposition. In harbour this was not noticed, but at sea the motion of the vessel caused such an offensive and nauseous smell to pervade the entire ship, as to render living in our cabin almost unbearable. It was not the good wholesome smell of blubber, of which I had previously had experience; but it was the sickly, disgusting stench of decomposed animal matter—an odour the offensiveness of which I can hardly now realize, and which is quite beyond my powers of description.

This smell was slightly ameliorated by causing a hole to be bored through the bottom of the ship, and thus admitting the water, which, finding its way into the bilge, was afterwards pumped out. In this way we, for a time, got rid of a portion of the objectionable matter; but during the remainder of our cruise, and more especially in bad weather, when our craft, lively at all times, but essentially so in a gale of wind, tossed about like a cork on troubled waters, we were condemned to endure the fragrant odour of what we facetiously termed the *bouquet à l'Isbjörn!*

CHAPTER XIV.

MEETING WITH THE "WILLEM BARENTS."

THE 18th of August was to us an eventful day, for on that evening we re-entered the Matyushin Shar, where, to our great surprise, we unexpectedly met the Dutch exploring schooner *Willem Barents.*

Although we knew that she was in the neighbourhood of Novaya Zemlya, we hardly expected to have met her so far south. She, like ourselves, had endeavoured to penetrate the ice in the Kara Sea, in the hope of reaching Ice Haven, at which place her commander was instructed to erect a memorial tablet as a record of the winter which the famous old Dutch navigator Barents, with his crew, passed nearly three hundred years before.

With this object Captain de Bruyne had attempted to sail up along the east coast, but on observing the state of the ice in the Kara Sea, he very wisely abandoned this idea, and after a few days spent in obtaining soundings and dredgings, and observing the movements of the ice, he sailed back into the Matyushin Shar, determining to pursue his course northwards along the west coast.

The *Willem Barents* had, from the early part of July, been busily engaged in sounding and taking serial temperatures in the Barents Sea on different meridians of longitude, and had already collected a very valuable and important series of observations connected with the physical geography of that sea.

On the 6th of July she had met the pack, consisting of exceedingly heavy ice, in latitude 75° 36′ north and longitude 26° east; and again, on the 20th of the same month, drift ice was fallen in with in latitude 76° 30′ north, on the forty-first meridian.

They then steered to the southward, hoping to be able to reach Ice Haven by passing through the Matyushin Shar and sailing up the east coast; with what result the reader is already acquainted.

We suddenly came upon her at nine p.m., lying quietly at anchor in Gubina Bay, on the south side of the strait. Immediately we caught sight of her, our long-neglected blue ensign was hurriedly sought for, and was soon fluttering from our gaff end, whilst the large pendant, emblazoned with the name of our little vessel, was ferreted out and displayed at the masthead. All available glasses were, of course, put into requisition and turned upon the little schooner, which, with her colours bravely flying, appeared a harbinger of glad tidings to us, who had been without European intelligence for some months.

But, irrespective of the pleasure of receiving home news, we also looked forward to the renewal of our acquaintance with the brave Hollanders on board, for we both had friends amongst the officers of the *Willem Barents.* Soon a small boat was seen to be shoving off and pulling in our direction, and a few minutes after we had the pleasure of welcoming Captain de Bruyne and the majority of his officers on board the *Isbjörn;* but as our cabin accommodation would not admit of receiving all our

MEETING IN GUBINA BAY.

friends below at the same time, we accepted the courteous invitation of our brother Arctic navigators, and spent the remainder of the evening in a social, not to say convivial manner, in the more sumptuous and palatial ward-room of the Dutch ship.

As she had left Europe more than a month after ourselves, and had again, more recently, called at one of the northern Norwegian ports for letters, we had the extreme satisfaction and pleasure of receiving a comparatively late mail from home. The delight and gratification experienced by us on the receipt of our letters, was considerably marred by hearing the sad news of the untimely death of the Prince Imperial.

I had already had personal experience of the deep interest which his Imperial Highness, together with his august mother, took in the subject of Arctic exploration, and I not only remembered the honour that was conferred upon us, when fitting out in the *Alert* and *Discovery*, by a visit from his mother and himself, but also the thoughtful present sent to the ships' companies of those vessels by the Empress, and the kind words with which she wished us success on our mission and bade us God-speed.

Within recent years two noble and gallant French lives have been laid down in the service of England, and both were volunteers. For, by a curious coincidence, on the very day that we heard of the sad fate of the Prince Imperial, namely, the 18th of August, but twenty-six years previously, Lieutenant Bellot, of the French Navy, perished on the ice whilst nobly serving with our countrymen in search of the lost Franklin and his crews.

It is by such sacrifices as these that nations are firmly knit together in amity and friendship, and it will be long before England, or those who boast of British descent, will forget the noble foreign blood that has been spilt whilst assisting us in the glorious cause of humanity, and in fighting the battles of a country which for a time might almost be called an adopted one.

It is impossible to overrate the kindness and consideration we experienced at the hands of Captain de Bruyne and his officers. Their programme, for they were about to sail on the evening we met them, was even slightly altered in order to suit our convenience. Everything almost that the *Willem Barents* contained was placed at our disposal, and our wants—and I fear they were many—were at once administered to.

Our crockery was in a sadly cracked and dilapidated state ; at least, what little the lively antics of the *Isbjörn* had not completely demolished. This was observed by our kind friends, and a complete "fit out" of cups, plates, and tumblers made of toughened glass was sent to supply all deficiencies.

Our boots, from continuous walking over rocky and rough ground, were in a most deplorable condition; leather was at once forthcoming from the stores of the Dutch ship to repair them, and even a pair of new boots found their way on board the *Isbjörn.* My arsenical soap, for the preservation of birds' skins, had long come to an end, but through the kindness of the Dutch zoologist I was again able to wage war against the feathered tribe, and preserve their nice warm coats for transmission to England.

And for all this kindness we were only able to repay them by a present of fresh meat. It was, however, an acceptable one; for, having been continuously at sea, they had not been revelling, as we had, in the luxuries of venison and other dainty dishes.

My companion and myself will always look back with feelings of great pleasure to the few days we spent together in the Matyushin Shar, when the Dutch and English flags for the first time fluttered side by side in friendly harmony off the sterile shores of Novaya Zemlya.

Our meeting with the *Barents* affected our future plans, for instead of going to Spitzbergen as intended, we resolved to make another attempt to round the northern extreme of Novaya Zemlya, and perhaps visit Ice Haven in company with the Dutch.

We felt that so long as they were with us, or at any rate *somewhere* in our vicinity, our timorous crew could not possibly object to proceed, and that their presence would act as a cordial upon our men, and stimulate them into showing a small amount of energy and courage. In case of any untoward accident happening to either ship, the knowledge that relief was not far distant would be reassuring, and would make us feel more confidence in attacking the ice, or sailing in parts almost unknown and unexplored.

The two vessels remained in company during our passage through the Matyushin Shar, where an interchange of visits was constantly kept up. One evening we went so far as to have a dinner party on board our little craft, when no less than five actually sat down. Kilgallon gave us an excellent dinner, but it must be acknowledged that our space was decidedly limited and we were terribly squeezed for room, more especially as one of our guests was by no means infantine in his proportions!

During light breezes or with the wind free, we found that the *Willem Barents* had the heels of us, but beating to windward in a stiff breeze, we were able to walk away from her.

I ought not to omit mentioning that our old friend Grant, the amateur photographer who had accompanied Allen Young in the *Pandora* in 1876, and who had also sailed in the *Willem Barents* in 1878, was again serving with the Dutch in his old capacity. During his three voyages to the Arctic regions he has succeeded in obtaining a very valuable collection of interesting photographs. He managed to get a very good photograph of the two vessels as they rode side by side in Gubina Bay, and he was also good enough to come on board the *Isbjörn* with his apparatus and take a photograph of our upper deck, put to rights, however, for the occasion.

Having agreed with Captain de Bruyne to meet, if possible, at Cape Nassau, or at the Ice Haven, and having also arranged with him about depositing records and building cairns in various localities to the northward, the two vessels separated on the 22nd, to pursue, independently, their own individual ways to the north.

Already the summits of the surrounding hills had put on a light covering of snow, but this was not the only indication of approaching winter, for we were compelled to resort to artificial light below, and from this date candles were in constant use in the cabin.

Vegetation also was fading very rapidly, and the beautiful little forget-me-nots had already assumed a washed-out appearance, whilst many of the other flowers were quite withered and decayed. Birds

GUBINA BAY

also seemed to be decreasing in numbers, at least in comparison to the amount we had seen a month previously, although we were so fortunate as to secure a new specimen, the *Strepsilas interpres*, which was shot flying over the ship.

Whilst working up along the coast, we shot at and nearly harpooned a large fish that was imprudent enough to approach within three or four feet of the vessel. At first I took it to be what is called by the whalers a "little finner" (*Balænoptera rostrata*), but on a second and clearer view of the animal, I was induced to alter my opinion; and although our crew adhered to what they first said, namely, that it was a "whale-fish," I was much more inclined to think that it was not a cetacean at all, but an enormous shark. Its back was of the same colour as a whale's, and its pectoral fins were also similar to those of that animal, and were white underneath; but there all resemblance ceased, and although it came to the surface several times whilst swimming round the ship, it was never observed to blow. It was almost fifteen feet in length, and when struck by a bullet from my companion's rifle, it turned partly over on its back, exhibiting a white belly, and gave a tremendous snap with its jaws above water. It possessed an enormous mouth, which was situated in the same position as that of a shark, and was furnished with rows of sharp teeth.

Its head was flat and was rounded off at the snout, and it had a dorsal fin. When wounded by the rifle ball, there was no indication of blood. I was quite unable to determine the species of the animal, and, if my description is full enough, I must leave it to others to decide, who are better able to judge than myself.

On the 25th of August a falling barometer, with every indication of a dirty night, drove us for shelter into South Solmenjeff Bay, where we proposed remaining until a favourable change in the weather would again enable us to proceed. On that night the sun set wild and fiery at half-past nine, leaving just sufficient twilight to enable us to discern the planet Jupiter, the first heavenly body, with the exception of the sun and moon, that we had seen since leaving England.

At the head of the harbour in which we had taken refuge was a large glacier entirely surrounding a range of hills. In fact, the glacier had more the appearance of being split in two by the hills, which seemed to grow out, as it were, from the very centre of the ice.

It was a novel but a glorious sight, to see this huge mass of ice winding far away between the ranges, until lost in the far distance—

> "On the broad plateau widening far inland,
> To watch the voiceless sea that spreads below;
> A thousand winters, with unwearied hand,
> Built yonder domes of snow."

On the morning after our arrival I landed, accompanied by one of the harpooneers, in order to make a closer inspection of one of these wonderful and sublime works of nature.

We first walked along the beach, on which we had landed, until within a short distance of the terminal face of the glacier, the rugged edge of which rose perpendicularly out of the sea to a height of about thirty-five feet. At its base, and therefore in the water, lay scattered about a few fragments of bright azure-tinted ice, that had been recently broken off, and had not had time to be carried away by either wind or tide. Crossing the lateral moraine, which consisted of large heaps of mud and stones squeezed and pressed into all sorts of grotesque and fantastic shapes, we ascended the sides of the glacier, and, attaining the summit, walked some two or three miles along it towards the interior.

The first part of our walk was a decidedly rough one; for more than a mile the surface along which we journeyed had the appearance of an irregular and chaotic mass of ice tumbled and jumbled about in the strangest confusion. I can compare it to nothing more appropriate than a turbulent, boisterous sea suddenly and instantaneously solidified by congelation.

Deep yawning crevasses, treacherously bridged over by a light covering of snow, over which we dared not pass, necessitated extra caution on our parts as we slowly clambered upwards.

Our guns we found decidedly an encumbrance, and I could not help longing for some kind fairy, the good spirit and protecting angel of Arctic travellers, to appear and convert them into more useful alpenstocks, with which we were unprovided. I do not think the sudden appearance of one would have caused me much surprise, for our surroundings were so novel, and so totally different to what we had been accustomed, that I almost imagined myself to be in fairyland!

I know nothing more deceptive to the eye than the appearance of the surface of a glacier. At a distance it looks so deceitfully smooth and level that travelling over it appears to be easy enough. But, on a nearer approach, the delightfully level plains are found to be intersected by a perfect network of broad streams running down towards the sea. These, by constant attrition, have so worn away the ice that the beds in which they flow are in reality considerable chasms many feet in depth.

Some of these cracks, or fissures, were of no great width, and these we easily jumped over, but the broader ones in some instances necessitated a long détour.

The sensation caused by a glance into the dark abysses was indescribable, but far from pleasing; for a glimpse into the dark, gloomy, and apparently bottomless cavities engendered the very disagreeable feeling of how excessively unpleasant it would be if either or both of us should be so unfortunate as to miss our footing, whilst crossing, and fall down one of them!

Indeed, on one occasion my companion had a very narrow escape of putting these feelings to the test. In spite of my warning, he would persist in crossing over a crevasse by a bridge of snow, which apparently offered safe footing, but directly it received his full weight gave way, and he only succeeded in saving himself from a fall of about one hundred feet into a narrow cleft by throwing himself forward and, with my assistance, scrambling up!

The murmuring of the running water, and the low, soft moaning of the wind, which mysteriously found its way to the bottom of these fissures, some eighty or a hundred feet below us, produced a very weird effect, enhanced, on gazing down into the depths beneath, by the beautiful icicles of all sizes that fringed the sides.

As we advanced the surface of the glacier assumed a more smooth and undulating character, a very material improvement to the walking, and proportionately appreciated by us. In some places, however, we found the ice to be a great deal *too* smooth; for it was so slippery that we had the greatest difficulty in preserving a perpendicular position, and found it far easier to make progress on all-fours, however undignified it might have appeared!

Occasionally we passed places that were perforated with holes many inches deep, giving the surface of the glacier the appearance of a huge colander. These perforations I attributed to the fall of rain. Also we found, in several spots, little heaps of black earth which had, obviously, been forced up by the enormous pressure exerted by the huge frozen river, as it gradually flowed onwards towards the sea.

I also observed the same peculiarity which was noticed on the floes on a sunny day by the sledge-parties of Sir George Nares's expedition, namely, the bright iridescent colours caused by the sun's rays reflected on the surface crystals. The colouring, however, on the glacier was not to be compared in brilliancy to the bright sparkling gems that appeared to lay at our feet on the floes in the Palæocrystic Sea.

Having walked about three miles, we reached an estimated height of about eight hundred feet above the level of the sea, and this I considered was nearly the extreme altitude of the glacier. From this position we could see it extending into the interior, winding in long opaque sinuosities between the hills, until lost to sight in the distance.

On the top of the glacier I picked up the skull of a young fox, which had been probably dropped there by some bird of prey. It was bleached perfectly white, and was quite weather-worn, and had apparently been lying there for many years.

From observations made in Solmenjeff Bay, I came to the conclusion that the proximity of discharging glaciers was inimical to the presence of organic life at the bottom. I arrived at this opinion chiefly from the poor results of my dredgings, and from the examination of the stomachs of some seals that were shot in the bay, and which were perfectly void of all food.

On the 27th, the wind having moderated, the little *Isbjörn* was again under weigh, and, with a fair fresh breeze, bowling along merrily to the northward.

Early the next morning we were off Admiralty Peninsula, and exposed to a confused tumble of a sea, which had the unpleasant effect of stirring up the bilge water and treating us to an unusually strong dose of the objectionable odour, allusion to which has been made in a previous chapter. The smell was simply abominable! At ten a.m. we passed Willem Island, and had a magnificent view of the numerous large glaciers which adorn the coast in that neighbourhood.

At noon we entered the Lystina Channel, and, passing by our old anchorage, sailed onwards between Cross and Tern Islands, and so along the west side of the outermost Pankratjeff Islands. There appeared to be little alteration in the aspect of the country since we last saw it, some six weeks before. Perhaps there was a little less snow; for although the summits of the hills were perfectly white, but little was to be seen in the valleys, or on the low lands. No ice could be seen in any direction, a circumstance that elated us considerably.

CAIRN ERECTED BY "ISBJÖRN."

As we had agreed with Captain de Bruyne to leave a record, detailing our movements, on the north-eastern point of the western Pankratjeff Island, we "hove to" at six p.m., on reaching the desired position, and, landing, erected a large cairn surmounted by a cross, on which our vessel's name was engraved. The record itself was deposited in a bottle, and buried, as previously arranged, ten paces magnetic north of the cairn.

The group called the Pankratjeff Islands, so far as we could make out, consists of two islands only, and not three, as laid down in the Russian chart. The eastern island is so close to the mainland that, to us, its insularity was extremely doubtful. Cape Petermann hardly aspires to or deserves the dignified appellation of a cape, for it is nothing more than a very long low spit, jutting out into the sea.

We had just completed our cairn when, on looking northward, we espied the *Willem Barents* apparently bearing down towards us. Seeing our Dutch friend so soon was rather unexpected, and, we feared, augured badly; for, knowing that she was going to take various sets of serial temperatures until the edge of the pack was reached, her appearance seemed to denote that the ice could not be far distant.

Hurrying on board, we hoisted our colours, an attention which was immediately responded to by the Dutch; and the two vessels, about a couple of miles apart, stood on in the direction of Cape

Nassau. The next morning, however, we lost sight of our consort, and imagined that she had stood in towards the Barents Islands, in order to examine the depôt of provisions established there by the Austro-Hungarian expedition in 1872.

At six a.m. we rounded Cape Nassau, or rather what we took to be the cape—for the coast line is so inaccurately delineated on the chart that its position is quite problematical, and it is not at all surprising that the Dutch, in 1878, experienced great difficulty in ascertaining which was the true Cape Nassau.

To the eastward of another cape, which we set down as Cape Troost, were some magnificent glaciers, which were continuously discharging large fragments of ice into the sea, compelling us to be careful in our steering as we threaded our way through these ice accumulations.

At nine o'clock the wind freshened considerably, necessitating a reef being taken in. By noon the gale increased and blew with great violence, reducing us to a close-reefed mainsail and staysail.

Being off the entrance of what we supposed to be Russia Bay, we endeavoured to beat in, hoping there to find a safe anchorage and shelter from the fury of the gale. Our intention was, however, completely frustrated by the extreme violence of the squalls that assailed us, and which swept down, keen and biting, over the smooth summits of the glaciers with a velocity that nothing could withstand, cutting the surface of the sea and lashing it into a sheet of white spray and foam.

We were soon reduced to a balanced reefed mainsail and a close-reefed staysail; but, even under this small canvas, our little cutter was frequently almost on her beam-ends, as the gusts struck her with terrific violence. For a short time, indeed, we were only able to show our close-reefed fore-staysail.

Although our position was not a very enviable one, still we could not but be struck with the grandeur and awful sublimity of our surroundings.

The high coast, bleak and sterile in the extreme; the lofty glaciers pursuing their tortuous way between the hills like huge white serpents, shining and glistening as the fitful gleams of sunshine fell upon their sleek and even surfaces; icebergs dashing and crashing against each other, as they hove and tossed on the troubled billows of the ocean—

> " And from the open sounds upon the coast
> The shock of icebergs shattering as they pass,
> Rings clear, as when, with fierce acclaim, Greek hosts
> Smote on the shields of brass;"

above all, the wild shrieking of the gale, as it burst with uncontrolled fury over the hills, seemingly intent upon the destruction of the little vessel that dared to invade the almost sacred regions of the dread Ice King; whilst each wave, as it rapidly followed its predecessor, appeared as desirous of engulfing us in its briny and insatiable maw! It was indeed a boisterous, hurly-burly scene, but one that it is better to attempt to imagine than actually to experience.

Meals were, of course, quite a scramble, more especially as the galley fire was on more than one occasion extinguished by the seas that unavoidably fell on board.

Before the gale had reached its extreme height, and whilst we were endeavouring to work into Russia Bay, our little craft again, almost by a miracle, escaped destruction. We had attempted to tack, but a heavy sea on our weather-bow made us "miss stays," which means that we failed to get round. The ship's head paying off, and the vessel instantly gathering way before she was again under command, we rapidly approached a heavy piece of ice, a collision with which, we had a pretty sure impression, would be fatal. The helm was hard up, but the little cutter, as if intent on suicide, utterly disregarded the injunction, and rushed headlong towards the danger. The old skipper, who happened to be steering at the time, cried out in an agonized voice to "lower the peak;" but the wind, as if defying his efforts, blew the words back again into his mouth before they reached their intended destination. Again and again was the cry repeated. It was an anxious moment. The men forward, though they saw his lips moving, were unable to comprehend the order; until at last one man, more intelligent than the rest, either hearing the order or, more probably, realizing the danger, rushed to the peak halyards and let them go. The vessel's head immediately paid off, and the danger was avoided. But it was a close shave, for so near did we glide past that I could easily have touched the ice with my hand as we shot by in safety under its lee!

The night of the gale was a cheerless one, but the next morning, the wind having abated considerably, we were enabled, under reduced canvas, to stand in towards the land, off which we had been blown about fifteen miles. It was extremely fortunate for us that the gale had been an off-shore one. Had it blown from the opposite direction, nothing could possibly have saved us from being dashed to pieces on a lee shore.

During the afternoon we succeeded in "fetching in" to the Barents Islands, off which we anchored, but as the squalls still blew with great violence, we were unable to land until the following day.

The Barents Islands are low and comparatively flat; they are composed of the same highly fossiliferous limestone as Berg Island, already described.

Conspicuous on one of the islands are some large mounds or hillocks which, from their resemblance, have been called by the fishermen the "Three Coffins." These mounds consist of layers of a kind of friable slate, in a very advanced state of disintegration, and at a distance were not at all unlike the massive walls and buttresses of some ruined castle gradually crumbling into decay. Large portions, we could see, had fallen very recently. They form a very singular feature of the otherwise flat island on which they rest.

Although we made a very careful and diligent search for the *Tegetthoff's* depôt of provisions, it was fruitless. No signs, or any indications whatever, could we find of it, and we therefore came to the conclusion that it had been buried under some of the large masses that had become detached from the "Three Coffins," and was possibly hidden under the *débris*.

We found the Arctic terns (*Sterna hirundo*) breeding in large numbers on the islands, the young ones being in that unpleasant transitory state between being fledged and able to fly. The old birds followed us about wherever we went, soaring gracefully over our heads, uttering their jarring, discordant cry. Such a harsh note do they utter, that I could not help thinking that their throats would be excessively sore from the vociferous screaming with which they assailed us.

A westerly gale suddenly setting in necessitated a speedy departure from the Barents Islands. With a flowing sheet we rounded Cape Nassau, but a combination of rain, snow, and sleet prevented us from distinguishing anything very clearly. After a rapid run of two or three hours, we had the satisfaction of entering Russia Bay, where we found good anchorage.

During our stay in this harbour, it blew so furiously from the south-west, that for three days it was quite impossible to leave the ship in order to explore the coast. On the 1st of September it blew with great violence, and there was a heavy fall of snow. Such was the fury of the gale that we dared hardly venture on deck. Although at anchor within two hundred yards of the shore, the weather was so thick that the land was invisible the whole day, whilst everything on our upper deck was completely buried under the immense quantity of snow that had fallen. The barometer during this time was unusually low, but its depression may be attributed as much to the snow-storm as to the wind.

When, at intervals during a lull in the storm, we were able to obtain a glimpse of the shore, we saw, as we feared and anticipated, that the whole country was completely covered with snow. Winter had claimed it for its own, and had enveloped it in its impervious winding-sheet. The temperature had also fallen some degrees below freezing point.

I could hardly be surprised at this when I recollected that four years before, on the 1st of September, the *Alert* had reached her winter quarters, and under much the same circumstances as those under which we entered Russia Harbour, namely, during a south-west gale and a blinding snow-storm.

The northern part of Novaya Zemlya must not, however, be compared with Smith Sound. Six degrees of latitude and 120 degrees of longitude make a vast difference, as regards climate, in the Arctic regions.

The neighbourhood of Russia Bay appears to be a regular nursery for gales of wind. Old Barents, and more lately Carlsen, met with the same boisterous and turbulent weather in its vicinity. Payer experienced the same during his pioneer voyage in the *Isbjörn* in 1871, whilst the Dutch in 1878 were completely baffled by the severity of the weather.

During the nights we were frequently startled by loud reports resembling thunder, but which proved to have been caused by the disruption, or rather the formation, of an iceberg from the parent glacier.

We were unable to see the commotion made by the sudden immersion of these masses of ice into the water, and had to content ourselves with listening to the loud detonations reverberating in prolonged echoes along the distant hills.

On the 4th, the wind moderated sufficiently to allow us to land, when, walking to the extreme western point of the bay, with my prismatic compass I was able to determine, at least to my own satisfaction, the respective positions of Capes Nassau and Troost, about which there had been so much doubt.

The former was about six miles distant, and, from the bearing on which I saw it, had the appearance of a large cluster of rocks projecting into the sea, but connected with the mainland by a low, narrow spit. Cape Troost forms the eastern extreme of the entrance to Russia Bay.

Russia Bay itself is unmistakable; a large island, not shown on the chart, lies near the eastern side, whilst a pyramidal-shaped hill, on the neck of land which forms Cape Troost, marks its north-eastern boundary. Rocks abound on either side, but are easily avoided by keeping in mid channel, or by not approaching the land within three or four hundred yards. It is a fairly good harbour, and affords protection from any wind. A small bay on the east side would be the one in which shelter should be sought from a northerly gale.

On the few patches uncovered by snow that I crossed, there was an entire absence of vegetation, but I picked up a few dead and withered branches of the *Salix arctica*. In a corner, amongst some rocks, I saw a little *Papaver nudicaule* in bloom, but drooping as if ashamed at being caught out by itself, so long after all its companions had disappeared. We shot here a red-throated diver (*Colymbus septentrionalis*), a bird that we had not observed further south.

Although the north end of Novaya Zemlyà is not covered by a *mer de glâce*, glaciers exist between almost all the hills, whilst nearly every valley appears to be occupied by one of these large frozen rivers.

Not only the valleys, but even the ravines, were filled by infantine glaciers, fed probably from the one stock off which they branch, winding their sinuous lengths towards the sea. During my walk I crossed at least a dozen of these miniature glaciers. They appeared to me to be formed, in the first place, by excessive accumulations of snow, which, being gradually converted by pressure into ice, are afterwards assisted in their growth by the rivulets running into them from the larger glaciers during the summer, which are, in their turn, frozen on reaching the accumulations referred to, and thus gradually, year by year, increase in size and bulk, until they attain the dignity of a glacier.

Taking advantage of a moderately fine day, we put to sea again on the 5th of September, and shaped our course northwards.

CHAPTER XV.

NORTHWARD HO! AND HOMEWARD BOUND.

THE hills bordering the north-west coast of Novaya Zemlya are from about one thousand to two thousand feet in height. When we saw them, their summits were so white and smooth with their wintry covering, that it was really difficult to detect the line of demarcation that separated them from the glaciers that rested in the valleys between.

The Gulf Stream Islands, to the northward of Cape Troost, are incorrectly laid down on the chart, being much nearer to the mainland. Good anchorage, according to one of our harpooneers, may be obtained inside them.

During the afternoon of the day we left Russia Harbour, we passed through several light streams of fresh-water ice, composed of the fragments and *débris* that were continually falling from the glaciers. At first these streams were mistaken for out-lying portions of the pack; but on nearer approach, their nature was unmistakable. Fresh-water ice is always much more transparent, and, when not of a bright blue colour, is darker (I have sometimes seen it almost black), than salt-water ice, which is rarely, if ever, seen without a coating of snow, except when it is in a very advanced state of decay. At a distance an accumulation of this glacier ice will not unfrequently be mistaken for an indication of the proximity of the pack, and it is only by a close inspection that its real character will be detected.

On the morning after leaving Russia Bay we rounded Ice Cape. It is certainly well named, for, covered as it was with snow when we saw it, it resembled a long low glacier shooting out into the sea.

This cape was discovered and named by Willem Barents during his first voyage in 1594, and placed by him in latitude 77°.

The year 1594 must have been a remarkably favourable ice season; for Ice Cape, or Ice Point as it was then called, was reached and passed without much difficulty on the 29th of July. The pack, however, was in close proximity, and Barents only succeeded in attaining this high position by rigidly adhering to the land water that existed between the ice and the coast.

In the graphic account written by Gerrit de Veer of Barents' last expedition, there is no mention made during the outward voyage of this cape, but we read that on the 12th of August, after encountering great difficulties from the ice, they made their ship fast off a point of land, "and called that point the Small Ice Point." This is a small promontory a few miles to the southward of what is now sometimes called the Great Ice Cape.

But Ice Cape itself was the following year rendered memorable, and earned a melancholy interest for itself, as being the scene of the death of Holland's most renowned Arctic explorer; for it was whilst the boats were off this cape, their crews escaping almost from the jaws of death, that sturdy old Willem Barents breathed his last. The event is thus alluded to by De Veer: We "sailed west and west and by south to the Ice Point. And being there, both our scutes* lying hard by each other, the maister [Jacob Heemskerck] called to William Barents to know how he did; and William Barents made answeare and said, 'Well, God be thanked, and I hope before we get to Wardhouse to be able to goe.' Then he spoke to me and said, 'Gerrit, are we about the Ice Point? If we be, then I pray you lift me up, for I must view it once againe;' at which time we had sailed from the Islands of Orange to the Ice Points about twenty miles; and then the wind was westerly, and we made our scuts fast to a great piece of ice, and there eate somewhat; but the weather was still fouler and fouler, so that we were once againe inclosed with ice and forced to stay there.

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* *Schuijt* is the Dutch for a "boat:" hence "scute." These boats had been built by the Dutch at their winter-quarters.

"The 17th of June, in the morning, when we had broken our fastes, the ice came so fast upon us that it made our haires start upright upon our heades, it was so fearefull to behold."

Here they remained for four days, unable to proceed on account of the ice.

These poor fellows, it must be recollected, were all more or less suffering from scorbutic affections, but Barents and one other man, named Adrianson, were the only two hopeless cases. De Veer continues: On the 20th of June, "Claes Adrianson began to be extreme sicke, whereby we perceived that he would not live long, and the boateson came into our scute and told us in what case he was, and that he could not long continue alive; whereupon William Barents spake and saide, 'I thinke I shal not live long after him:' and yet we did not judge William Barents to be so sicke, for we sat talking one with the other, and spoke of many things, and William Barents read in my card * which I had made touching our voyage; at last he laid away the card and spake unto me, saying, 'Gerrit, give me some drinke;' and he had no sooner drunke but he was taken with so sodain a qualme, that he turned his eies in his head and died

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* Chart.

presently, and we had no time to call the maister out of the other scute to speake unto him; and so he died before Claes Adrianson, who died shortly after. The death of William Barents put us in no small discomfort, as being the cheife guide and onely pilot on whom we reposed ourselves next under God; but we could not strive against God, and therefore we must of force be content."

Thus died brave Willem Barents, a skilful pilot, an experienced seaman, as well as a daring and successful navigator. How his remains were disposed of is not related, but in all probability they were buried in the neighbourhood of Ice Cape. How Heemskerck and his sturdy followers reached Holland is a matter of history, and therefore I will not allude further to the adventures of the gallant little band of Dutchmen who, for fifteen months, had followed the fortunes of Barents.

To return to the *Isbjörn*. After rounding Ice Cape, the wind freshened considerably and veered round to the eastward. At one p.m., being close to the Orange Islands, we landed and constructed a cairn on the north-east one, in which a record was left, as had been previously arranged with Captain de Bruyne. We rather expected to find that they had been there before us, but could detect no traces, or any indications whatever that would lead us to suppose that they were ahead of us.

On account of the high sea that was running, we had an extremely wet journey on shore, and experienced great difficulty in landing on the exposed beach. The Orange Islands are two in number, besides rocks. They were named by Barents, during his first voyage, after the Prince of Orange. They are barely half a mile in breadth, by a few hundred yards in width, and about a hundred feet above the level of the sea. The sides are precipitous, but the summit, when reached, is nearly flat. They are of limestone formation.

On the top we found the remains of an old cairn that had probably been constructed by some Norwegian walrus-hunters.

By rounding the Orange Islands, we had the honour of carrying the British flag for the first time to the northward of Novaya Zemlya.

When about twelve miles to the northward of the islands, we attempted to get soundings, but failed, although a hundred fathoms of line were paid out. In a small vessel, unless absolutely stationary, which can only take place in a dead calm, it is almost impossible to obtain an up-and-down cast, so as to get soundings, in consequence of the rapidity with which the vessel "bags to leeward;" as a rule, she drifts as fast as the line runs out.

Our prospect of reaching Ice Haven had now considerably brightened, and although our crew evinced a very decided disinclination to proceed, a course was shaped for that interesting spot. It was with no little difficulty, however, that we succeeded in getting the ship's head pointed in the right direction, for after our return on board from the Orange Islands, we were informed that old "Jog.," instigated doubtless by the chicken-hearted harpooneers, had resolved he would go no further to the eastward! On sending for him, he adhered to his resolution, excusing himself for his want of courage by saying that the nights were getting long and dark, and he was afraid of being beset in the ice. Now, this reason was excessively ridiculous, considering that there was not a particle of pack ice to be seen in any direction, whilst a chopping sea and a swell from the south-east were sure indications that plenty of water existed in that direction.

My companion, however, who, with the *suaviter in modo* for which he is so pre-eminently known amongst his friends, possesses in no small degree the *fortiter in re*, had such a conversation with our worthy skipper, who was told that we should not fail to proclaim his cowardice on our return to Tromsö, that he mildly acquiesced in our wishes and steered the ship in the desired direction.

In the afternoon we passed Cape Mauritius, named after Prince Maurice of Orange, without seeing the dreaded pack. But the day was not allowed to pass without several cries of "wolf;" for every little stream of ice, although consisting only of the small brashy stuff washed away from the base of a glacier, was at once magnified into a solid pack.

Unfortunately for us, on the following morning we fell in with a few loose streams of ice, when the men positively refused to proceed any further. It was useless contending or even remonstrating with them! Ice Haven, with all its interesting historical associations, had to be given up, and we were reluctantly compelled to submit, like Captain Reece, to the wishes of our crew. The ship was put about, and a course steered to the north-north-west.

The furthest point reached by us was off the old Vlissinger Hooft of the Dutch, and within about thirty miles of Barents' winter quarters at Ice Haven. So far as we could see there was no ice whatever along the coast from Cape Mauritius southwards, whilst we could only see a few loose streams to the eastward, about ten miles off the land.

It was these latter straggling pieces of ice that made our men so remarkably *prudent*, for they averred it was the outskirts of the Kara Sea pack, which, closing upon the north-east point of the island, would effectually cut off our retreat. I was, however, of a different opinion, and firmly believed that the Kara Sea pack was well to the southward, and that a vessel would have had little or no difficulty in reaching a high latitude in a north-easterly direction. Subsequent events tended to corroborate my opinion.

The aspect of the country south of Cape Mauritius was very similar to that on the east coast, south of the Matyushin Shar; that is to say, it was low and undulating, and altogether an uninteresting looking land. The noble hills and grand-looking glaciers of the west coast appear to cease at Ice Cape; we saw none beyond. I have been told that glaciers exist south of Ice Haven, but I am not, unfortunately, in a position to verify the statement.

The Ice Haven plan having to be abandoned, we determined to do what little we could, at such a late period in the season, in the way of examining the edge of the ice in the Barents Sea. We expected to have some little trouble in keeping "old Jog." up to the mark; but so long as we did not actually enter the pack, we did not think he could well object.

About five and twenty miles to the north-west of the Orange Islands, we passed through some loose streams of ice, in some instances so closely packed that we were compelled to alter our course in order to get round the projections. As we went west, however, they became more loose, and were composed of much lighter ice, until we lost them altogether. At this time we experienced a strong northerly current; the same, doubtless, that drifted the ice-bound *Tegetthoff* to grand discoveries.

On the evening of the 8th of September, in about latitude 77° 55′, to our intense astonishment, we again sighted our Dutch friends in the *Willem Barents.* They were at the time steering to the south-west, whilst we were standing in a north-westerly direction. It was blowing too hard to effect communication, and a heavy sea was running. We passed within about two miles of her, but perceived no indication that we had been seen by those on board. Subsequently we were informed that we had been sighted, but were mistaken for a Norwegian walrus-hunter, as we had been rather averse to exposing our precious blue ensign to the ruthless mercies of a northerly gale. As may be imagined, suddenly sighting her as we did caused a good deal of excitement on board our little craft, and gave rise to many speculations as to where she had been, and how far north she had gone.

Had we been able to communicate with her, we should have received the pleasing and gratifying intelligence that she had actually sighted Franz Josef Land the previous day, and that without experiencing any difficulty from the ice!

Having accomplished their original intention of erecting a memorial stone on Cape Nassau, which was placed on the 29th of August, the very day we were assailed by that furious gale of wind a few miles to the northward, the Dutch attempted to reach the Pankratjeff Islands, in order to leave a record there for us, as agreed between Captain de Bruyne and myself. This intention was frustrated by the same gale of wind which we experienced, but which reached them a little later in the day. They then proceeded in a northerly direction, with a view to examining the ice between the fiftieth and sixtieth meridians of longitude. When in latitude 78°, they met a few streams of loose ice; but east of them appeared plenty of open water. To the west (as we found to our cost) was ice and an ice blink. After running a few miles to the northward, they lost sight of the pack ice altogether, and saw only a few icebergs.

On the evening of the 7th they sighted Franz Josef Land, extending from north-east-by-east to north-west-half-west, and slowly crept up towards the land. Fortunately, the weather was clear, and the sun shining brightly on the snow-covered hills and glaciers, enabled them to get good bearings of the distant land.

By these bearings, they computed their latitude at 79° 40′ north, and their longitude at 54° 20′ east. Cape Brunn showed out very distinctly, and McClintock Island was found to be completely surrounded by ice.

Many icebergs were in sight, but *no pack ice!*

They were only able to approach to within a few miles of the ice that encircled McClintock Island for about the same distance. A threatening appearance in the weather, and a knowledge that a large amount of ice was in their vicinity, prevented any extended exploration of the coast, and it was deemed prudent to return at once, without having an opportunity afforded them for landing. The helm was accordingly put up, and a southerly course shaped.

When they passed us on the following evening, they imagined we were the same Norwegian walrus-hunter that they fancied they had seen off the Pankratjeff Islands; therefore no attempt, as the weather was bad, was made to communicate with us.

Captain de Bruyne deserves great credit for the skilful manner in which, at such a late season of the year, he carried his little craft to such a high position, and also for the skill and prudence that he exhibited in extricating her from what might have been an extremely unpleasant and precarious situation.

All honour to the gallant Dutch for the great success which they have achieved, and may they still persevere in their endeavours to solve the hidden mysteries of the unknown and hitherto inaccessible North.

On the same evening that we saw the *Willem Barents*, being in latitude 78° 8′, a strong northerly gale compelled us to lay to, under close reefs, for twenty-four hours, during which time we were blown and set a long way to the southward. The heavy sea that accompanied this gale was a pretty sure proof that the pack was not in our immediate neighbourhood.

A gale of wind at any time, even in a large commodious ship, is bad enough; but in a tiny little forty-ton cutter, with a temperature below freezing point, a heavy sea running, and a most abominable and nauseous smell pervading the entire vessel, it is abject misery. To occupy one's self in any way is out of the question, for walking is of course an impossibility, and yet to remain on deck without moving and keeping the blood in circulation, meant simply to get wet through from the spray that dashed along the deck, which in two or three minutes would freeze. The only alternative was to remain below, at the risk of having our heads broken by the falling of some book, rifle, knife, or other trivial weight.

Even when the gale moderated we were in as uncomfortable a plight as we were when it was at its height, for it left as a legacy a very confused sea, which tumbled the little *Isbjörn* about in a most aggravating manner for the succeeding forty-eight hours.

Early on the morning of the 11th, a north-easterly breeze sprang up, which enabled us, in spite of the remonstrances of some of our crew, to shape a course to the north-west, and thus regain some of the northing lost during the gale. At midnight we reached the latitude of 77° 50′, at which time there was not a particle of ice in sight.

Little rest was indulged in that night, for we were kept on the tenter-hooks of anxiety, momentarily expecting and fearing to hear the fatal cry of "ice right ahead!" We knew, if we could continue on our course, that we should, the following day, pass the highest position attained by the Dutch the preceding year, and go even beyond that reached by Weyprecht and Payer in 1871. Possibly the seventy-ninth parallel would be reached, and then Franz Josef Land might be seen!

By pointing out the ship's position on the chart to our worthy skipper, and showing him the very short distance we should have to go to reach a higher latitude than any ship had previously sailed to in those seas, we enlisted his sympathies on our side, and, ignoring the surliness and grumpiness of his harpooneers, incited him to action.

During the day we passed several small icebergs. One, long, low, and flat, about fifteen feet high, we judged to be the offspring of a Franz Josef Land glacier, as it differed greatly from the irregular-shaped fragments that we had hitherto seen.

One of the harpooneers, so as to terrify poor old Jog. with the massiveness of the ice towards which he was rushing with headlong speed, declared this to be a piece of a floe; but, on closer inspection, even he was forced to admit that it was a berg.

A good run was made during the night, but the next forenoon, September 12th, ice was sighted in latitude 78°.

It is true they were only loose, straggling pieces that we saw, but they too surely indicated the presence of a pack, and were therefore a death-blow to our hopes of "doing grand things." Like Payer in 1871, we had felt, whilst running northwards in an iceless sea, that we were on the brink of great discoveries, which, alas! were never realized. Still we continued on our course, threading our way through the loose ice, determining to push on until actually compelled to relinquish the contest by meeting an impenetrable pack. Fragments of fresh-water ice were intermixed with the floe ice through which we sailed, and on some of the former the soil was seen to be still adhering. This appeared to me a sure sign that land could not be far distant, whilst their irregular and angular shape was another convincing proof. For when small fragments of ice have been subjected for any length of time to the action of the sea and weather, they become smooth and rounded, and lose the irregularity of outline which they necessarily possessed when they were first detached from the glacier. None of these pieces were more than seven or eight feet above the water.

This belief, on my part, in the proximity of land was further heightened by the increased number of birds of different kinds. Kittiwakes innumerable and fulmar petrels soared over our heads, whilst ivory gulls, skuas, dovekies, rotges, puffins, looms, and glaucous gulls hovered around us.

The looms were flying in small flocks of from six to twelve in each, which, in itself, was a certain indication that we were in the neighbourhood of "loomeries;" whilst the presence of the smaller birds, some of which are rarely seen at any great distance from the coast, contributed to strengthen my views that land was not far distant.

I knew, from Payer's chart, that we were scarcely one hundred miles from a portion of Franz Josef Land discovered by him, but as he had only seen it from the eastward, I saw no reason to prevent his Zichy Land from extending in a south-westerly direction to within perhaps forty or fifty miles of our position, and all the indications tended very materially to support this idea. I would have given anything to unravel the mystery, for, with Milton, I felt that—

> "Beyond this flood, a frozen continent
> Lies dark and wilde, beat with perpetual storms
> Of whirlwind and dire hail, which on firme land
> Thaws not, but gathers heap and ruins seem
> Of ancient pile; all else deep snow and ice."

The morning was fine and clear, but at ten o'clock the weather gradually thickened, snow began to fall, and a dense fog spread its unwelcome folds around us. This was exceedingly unfortunate and most tantalizing, for we knew these drawbacks would remove any chance we might have had of sighting Franz Josef Land. To add to our chagrin, the ice streams became more numerous, and we experienced greater difficulty in threading our way between them. The birds, too, appeared to leave us, or rather we failed to observe them through the thick, murky atmosphere, and all seemed wrapt in solitude.

> "Here all is ruled by silence far and wide,
> Save light waves lapping on the iceberg's side."

To our astonishment, old Jorgensen raised no objections to our pushing on, but seemed equally desirous with ourselves of reaching a high latitude. The idea of sighting the land, and of beating all those who had gone before him, appeared to have infused a new spirit in our worthy skipper. Of course, we patted him on the back, and did our utmost to keep him in the same laudable state of mind.

Persisting in our northerly course, at two p.m.

we passed the extreme position gained by the gallant Dutch the previous year, but, alas! we also found the ice getting more closely packed, and, driven by the wind, gathering ominously around us; besides which, the day was fast waning, and our nights were already lengthening considerably.

> "Jagged white spectres nodded their heads,
> Dead white against the smoke-black sky,
> Where the awful mountain wilderness spreads,
> To a cloudy winter world on high;
> Under their giant horror then
> The ghastly blackness of day began
> In freezing twilight to die."

With only four weeks' provisions on board our vessel, surrounded as we were by ice that might at any moment seize us in its resistless and unyielding grip, and with no indication of the fog lifting, we reluctantly came to the conclusion that it would be imprudent to persevere any longer in such thick weather, and the ship was therefore put about and a southerly course shaped, much to the relief of our crew, who had been in anything but a happy and amiable frame of mind during the day.

I rather think they regarded their venerable captain as having suddenly taken leave of his senses, or else that, "knowing nothing, he feared nothing."

Our highest position was, by account, latitude 78° 24′ north. To attain it we had sailed five and twenty miles into the ice; that is to say, that for twenty-five miles we had sailed through loose streams of ice.

This position was six miles further north than that attained by the Dutch in 1878, but fell short by fourteen miles of the latitude reached by Weyprecht and Payer in 1871. According to the chart, we were about eighty geographical miles from the land discovered by the last-named navigator, but, for reasons already mentioned, I am inclined to think we were much nearer.

The floe ice that we encountered appeared to be of two descriptions, which were indiscriminately mixed up with each other. One kind consisted of a few heavy pieces of from eight to twelve feet in thickness, whilst the remainder was of a much lighter character, and appeared to be ice of only one season's formation. We saw no floes of any kind, or any piece of ice sufficiently large to be magnified into a "floe" by the most imaginative person.

Although the ice was getting decidedly more packed, and there was more of it as we advanced, I am of opinion that a steamer would have experienced but little difficulty in pushing on. With a sailing vessel, however, it would be vastly different, and for a commander to do so would subject him to the charge of rashness. The probabilities of a change of wind, of a calm, or of the ice closing in behind, must never, in a vessel unprovided with steam power, be lost sight of, more especially at such a late season of the year as the middle of September.

A sailing vessel certainly labours under grave disadvantages. At the very time when the ice is particularly loose and open, namely in a calm, she is perfectly helpless. At other times, when a fine fair wind offers a speedy passage through the pack, those in charge hesitate about pushing on, because if the lead ended in a *cul-de-sac*, the difficulty of extrication would be considerable. It would entail the necessity of working to windward in a narrow ice-blocked channel, which would, in all probability, be gradually diminishing in width as the wind packed the ice.

The cruise of the *Willem Barents* is also an example of what a sailing ship skilfully handled may do; for she not only reached, but also returned in safety from, a region which a steamer approached in 1873—not of her own free will, it is true, but by being helplessly drifted in the ice, only to leave her timbers bleaching on that desolate shore.

There is little doubt that had Captain de Bruyne been in command of a steamer, he would have made one of the most brilliant and successful summer cruises in the Arctic seas ever recorded.

If we had known of the success of the Dutch, we should undoubtedly have made another attempt to reach a high latitude on a different meridian, that is to say, provided we could keep the courage of our crew up to the mark; and I have not the slightest doubt but that we should have been able to share with our Dutch friends the honour of having seen, and perhaps visited, Franz Josef Land. But, baffled as we were by the ice and by the weather, and ignorant of the conditions of the pack further to the eastward, it would have been highly injudicious of us, had we remained longer in an ice-encumbered sea. It must be remembered that during the last eight days we spent in high latitudes, the temperature was never above the freezing point, our rigging was twice its thickness with frost rime, and our ropes and sails were frozen hard. The days had also visibly shortened, and a night of several hours' darkness had to be endured.

The absence of light is the greatest, and perhaps the most dangerous, enemy that an Arctic navigator has to contend with, and it is, indeed, a merciful and all-wise dispensation of Providence that a never-setting sun should always be in the heavens during the navigable season inside the Arctic zone.

Although obliged to turn back when success appeared almost within our grasp, we may, I think, safely claim that no vessel, unless compelled to winter, had been in such a high northern latitude as that which we attained, at such a late period of the year. Before putting the ship about, we sounded in 105 fathoms, but failed to get bottom. The dovekies that we saw were nearly all clothed with their winter plumage, and even the rotges were slightly speckled about their heads and necks.

It was midnight before we succeeded in extricating ourselves from the ice—a fact, however, that was fully demonstrated, when it took place, by the lively motions of our liveliest of little cutters. Not only did we encounter a heavy sea, but also a fresh southerly gale, which quickly necessitated the taking in of a couple of reefs.

During the succeeding two or three days, rain and snow fell alternately, and the temperature rising considerably, caused the smell from our decomposing blubber to increase to such an extent as to be almost unbearable.

On the evening of the 15th we passed the largest iceberg we had hitherto seen. Its height was estimated at about 70 feet, and its length about 450 feet. It was a matter of conjecture with us whether this wanderer owed its origin to the glaciers of Spitzbergen, or whether it came from more distant northern lands.

On the same evening we sighted Hope, or as it is sometimes called, Seahorse, Island. The position of this isolated little bit of land was, eight years ago, found by Payer to be no less than forty miles different from its position as shown on the chart. The error has now been rectified. The position assigned to it by us agreed very well with that determined by Payer.

On the following day our friends at home had indeed got hold of the tow-rope, for we were scudding before a strong northerly gale at the rate of nine knots an hour. Never before, I should imagine, had the little *Isbjörn* flown along with such rapidity. It was a grand sight to watch the white-crested waves as they came curling up behind, towering over each quarter, and threatening to topple on board and overwhelm the little ship and all she contained. But when destruction seemed almost inevitable, the gallant little vessel rose bravely on the seething foam, and flew along on the top of the billow, until it passed gently away from underneath her, only to be succeeded by another and another.

The *Isbjörn*, on that day, bore out to the letter the reputation of being a good sea-boat which she had previously earned for herself, for with the exception of a little water that unavoidably lopped in occasionally over the quarters, possibly due to a want of attention on the part of the helmsman, she was perfectly dry.

Snow fell the greater part of the day, and lay in large drifts against the bulwarks, and the weather was as thick as pea soup! This mattered little, for we had plenty of sea room, and it was most unlikely that we should fall in with any other vessels. The road we were travelling was not an extensively used thoroughfare.

Unfortunately our fine fair wind barely lasted for more than twenty-four hours, when it was succeeded by a dead calm, in which we lay helplessly rolling about in a heavy confused sea, like a log on the water, for a couple of days. I was rather surprised at the long time the sea took to go down after the gale, for, as a general rule in the Arctic regions, the sea subsides almost as soon as the wind moderates.

Dining by candlelight was a decided nuisance, for our table, at no time very commodious, and with barely sufficient space to accommodate the necessaries for our meal, could scarcely afford room for the ingeniously constructed candlestick which Kilgallon manufactured out of a preserved-meat tin.

On the 17th we observed our first aurora. When seen it assumed the form of a perfect arch in the northern sky, having brilliant coruscations darting upwards and across the zenith. The arch then seemed gradually to dissolve, leaving bright streamers playing in the heavens. The display, for so it may very truly be called, lasted about four hours.

During the time we were on board the *Isbjörn* we certainly drank some of the most villainous decoctions under the name of water it is possible to imagine, and all because our Norwegian crew were too lazy to see the water barrels properly cleaned. Allusion has already been made to the "groggy" and "brackish" stuff we were forced to imbibe. The last inflicted upon us was so strongly impregnated with vinegar, that the preserved milk curdled when put into the tea. Vinegar casks had been taken on shore to be filled, without being rinsed out or cleansed, instead of the proper water barrels. Before we got in to Tromsö, we were reduced to only a few bucketfuls of fresh water, but it was of such a colour as to induce Kilgallon to remark that it looked as black as if half a dozen niggers had washed in it.

On the 20th of September we sighted the island of Soro, and that afternoon passed the island of Toppen, whilst ahead was Fuglo Island rising majestically out of the mist, its summit just tinged with the rays of the setting sun.

Our crew appeared to be happy and joyous at the prospect of soon reaching their homes, and they evinced their delight principally by indulging in melody; that is to say, they sang incessantly the whole day, and as each individual sang a different song to a different tune, the result was the reverse of harmonious.

On the 21st we passed Long Island, and on the following day reached Tromsö, where, in a few days, we had the extreme gratification of hearing, by telegraph from Hammerfest, of the great success achieved by the *Willem Barents;* which gave us as much pleasure and delight as if we ourselves had been so fortunate as to accomplish it.

CHAPTER XVI.

VALEDICTORY.

THE arrival of the *Isbjörn* at Tromsö brought to an end the cruise of our little cutter, which had been a home, and on the whole a very good one, to us for about eighteen weeks. Considering the well-worn and, indeed, almost rotten condition of our sails and rigging, I think we were extremely fortunate in getting back without experiencing any serious mishap. As it was, we did not escape scathless from our last breeze, which carried away the foremost shroud of our lower rigging, and necessitated, in consequence, a little extra caution for the remainder of the voyage.

Although our cruise was undertaken with sport and pleasure as the main features to be considered, yet the result of our voyage will serve to furnish additional evidence respecting the navigation of the Barents Sea; and, so far, it has been geographically successful. No effort was spared to obtain results that would be useful to geography, and to other sciences.

We left Tromsö in the mail steamer on the morning of the 25th of September, reaching Trondhjem on the 30th. Thence we journeyed by rail to Christiania, eventually reaching Hull on the 6th of October, where I separated from my kind friend and companion, each of us branching off to our respective homes.

Before bringing my work, which I hope may prove of some interest to the general reader, to an end, I think it would not be inappropriate, on my part, to make a few remarks regarding the best route to be adopted for future Polar exploration, with a view to insure a due measure of success.

If, when an Arctic expedition is despatched, the public will be satisfied with a reasonable amount of success, and will not immediately jump to the conclusion that because a vessel is equipped for the purpose of exploring the unknown region, therefore the British flag must certainly be displayed at the apex of our world, then I think we may rest perfectly satisfied that a well-appointed steamer will be acknowledged to have obtained a full measure of valuable results by pushing northwards in the Barents Sea.

The Arctic regions have of late years been so prominently brought to the notice of our countrymen, that it is almost superfluous on my part to point out that, before 1876, there were only three ways by which the Pole—for that really appears to be the spot on which the public mind is bent—could be approached.

The first was by the route which was followed by the English expedition of 1875–76, namely, Smith Sound. This route, I must remind my readers, was selected by men thoroughly conversant with Arctic exploration, for several important reasons. In the first place, land had been reported, by those serving in the American expedition under Hall, to exist as far north as 84°, and it is well known that the presence of land is necessary to insure success in exploration. Where there is a coast line, there is generally a strip of smooth ice adhering, called the ice-foot, along which sledges may be dragged with the greatest ease, after the ship has been secured in winter quarters. The sledging parties of Sir George Nares's expedition conclusively proved the impracticability of travelling over an extensive frozen sea away from land. In the second place, the region of Smith Sound was pretty well known, and it offered facilities for establishing depôts of provisions along its coasts in case of the loss of the vessels.

It was confidently anticipated that, by this route, the unknown region might be reached and new country explored. This belief proved to be correct, and the desired results were secured. It is by the Smith Sound route that the nearest approach to the North Pole has been made. But the work has been completed in the Smith Sound direction, and a new route must now be selected.

Behring Strait leads to a region perfectly unknown, in which a high latitude has never yet been reached; but this route has the drawback of being a long way from England. America has, I am happy to see, undertaken to make an attempt in this direction, and the present year ought to bring us tidings of the achievements of the *Jeannette* in that quarter.

The third route is by Franz Josef Land, and this, I maintain, is now the direction most likely to lead to the greatest possible amount of success.

The Franz Josef route was not selected when the English Arctic Expedition sailed in 1875, because it was easier to reach the unknown region by the Smith Sound route. Now, however, that the Smith Sound route has been successfully explored, we must turn our attention to the route which comes next in order, as regards the advantages to be derived from its adoption.

I think we may, by a careful reference to the chronicles of navigators in the waters around Novaya Zemlya, rest assured that the year (namely, 1872) in which the *Tegetthoff* was beset, was an exceptionally unfavourable ice season. The cruise of a little sailing schooner like the *Willem Barents* last year, has in itself been sufficient to prove the accessibility of Franz Josef Land; whilst, taken in connection with all other attempts that have been made to explore north of Novaya Zemlya, I am inclined to think that it may be reached at least in the proportion of two years out of every three.

The importance of the success of the *Willem Barents* cannot be overrated, for it shows that if Franz Josef Land can be reached by a sailing vessel without encountering any hindrance from ice, a well-appointed steamer would not only be able to do the same, but the probabilities are that she would experience no difficulty in reaching a still higher latitude. A position would thus be gained before the winter set in, as a base of operations, from which exploring parties would traverse a large tract of hitherto unknown region, and collect a great deal of valuable scientific information.

Let us now take a retrospective glance at all the observations that have been taken in the Barents Sea. We shall then be able to make our own deductions regarding the normal condition of the ice in those waters, and the prospects of carrying to a successful issue any attempt that may henceforth be made to extend exploration in high latitudes by this route.

We must not forget that, until very recently, we were labouring under the impression that Franz Josef Land was unapproachable, because it was believed that ice of a massive nature existed to the southward. When the *Tegetthoff* was beset, it was this reported heavy pack that appeared to offer such a serious obstacle to the successful circumnavigation of Novaya Zemlya; but I will endeavour to prove, not that this impediment has no existence, but that it is partially removed, even if it is not wholly so, at a late season of the year. The mistake that has invariably been made by navigators is that of attempting to explore *too early in the season.* It is certainly a very natural mistake, for there is no doubt that the difficulties of ice navigation are very greatly increased after the sun has once set.

One of the great disadvantages of the route which I now advocate is the prevalence of dense fogs, but this is an inevitable evil in all parts of the Arctic regions, although perhaps the Barents Sea bears the palm for a long continuance of thick weather. Gales of wind and high seas may also be encountered in the Barents Sea, to a greater extent than is generally met with in Baffin Bay and seas adjacent. But it is these same gales and rough waters that assist so materially in breaking up a pack and dissolving the ice.

Willem Barents, in 1594 and in 1596, was the first to reach a high latitude along the west coast of Novaya Zemlya. During his first voyage he actually reached the north extreme of that land, and discovered and named the Orange Islands on the last day of July! To arrive at this remarkably high position so early in the year, he had worked up between the ice and the land. Had he remained another month, the pack would, in all probability, have entirely disappeared. Indeed, at the very time they turned to come back the ice was breaking up, and this is given as one of their reasons for not pushing on; for, says the historian of the voyage, "it began more and more to blow, and the ice therewith brake in peices." The men also evincing a disinclination to proceed was another reason for his turning back. The year 1596 does not appear to have been such a favourable one for ice navigation, yet, in spite of the difficulties they experienced, Barents and his gallant crew succeeded in rounding the north extreme of Novaya Zemlya and establishing himself in Ice Haven before the end of August!

In October Barents writes that the sea was "*free of ice;*" and even on Christmas Day, he says, there was "much open water!" On the 8th of March he writes: "No ice to be seen north-east," and he came to the conclusion that there was an open sea in that direction. On their return journey the following year, they repassed the Orange Islands during the month of June! It is true they had only boats to navigate in, and that these were hauled up on the ice whenever the pack closed in to the land, but still it shows that, even at that early period, lanes of water existed and were navigable in a very high latitude. Gerrit de Veer, who wrote the account of this remarkable voyage, says on the 22nd of June, whilst off Ice Cape, "it blew a good gale out of the south-east, and then the *sea was reasonable open,*" but they were forced to drag their boats over the ice to get into it.

In 1612 Captain Jan Cornelis van Hoorn sailed up the west coast of Novaya Zemlya, with the intention of attempting to find a passage to India by rounding its extreme northern point. On the 14th of July he reached latitude 76°, some distance from the land. On the 8th of the following month he was in 76° 30′, and two days later in 77° 30′, when he relinquished further attempts to advance, for what reason is not given, and returned to the southward. He was, in all probability, stopped by loose ice, but here again he was *much* too early in the season. Had he remained a fortnight later, he would have had no difficulty in prosecuting his voyage, until, at any rate, stopped by the ice to the eastward of Novaya Zemlya. Van Hoorn found the ice very much in the same position that we did; therefore it is fair to presume that it would, as with us, disappear by the month of September.

Hudson and Wood, in 1608 and 1676, failed to attain a high latitude, and were stopped by the pack, but in the case of both these navigators they gave up in the month of June, which now would be considered as much too early even to think of *commencing* exploration.

Another Dutch navigator, Willem Vlamingh, in 1664 claims to having sailed as far north as latitude 82° in a north-westerly direction from Novaya Zemlya. This statement must be received *cum grano salis*, for had he reached the position claimed, the honour of discovering Franz Josef Land would be his. That 1664 was a good ice year is certain; for, disregarding the high latitude said to have been attained, there is no doubt that Vlamingh sailed round the north end of Novaya Zemlya, and saw but little ice. He also asserts that he sailed 280 miles in a north-east direction from the Orange

Islands without any impediment from ice. This would place him in about 81°! He considered that the condition of the ice around Novaya Zemlya was in a great measure influenced by the prevailing winds. He reports having seen no ice whatever around Novaya Zemlya, and, with the exception of a floe here and there, none in a northerly direction.

The present Admiral Lutke, it will be remembered, during the early part of the century, failed to reach a high latitude along the west coast of Novaya Zemlya; but, then, Lutke invariably turned to come south either in the months of June or July. Once only did he remain until the early part of August, when he expressly states that he deemed the season too far advanced to make further exploration prudent. If he had remained a few weeks longer, he would probably have found, as we did, that the ice fields which obstructed his passage would have vanished, and he would then have experienced no difficulty in sailing round the island. As a set off against Lutke's want of success may be mentioned the voyage of another Russian, named Sawwa Loschkin, who, in 1760, successfully circumnavigated both islands.

The experience of Pachtussoff in 1833 tends materially to confirm my ideas regarding the time of the year in which exploration should be undertaken, for in July he was stopped by the ice in the vicinity of Berg Island, almost at the same place and time as we were stopped in the *Isbjörn*.

Lutke, who is undoubtedly a great authority, recommends, in circumnavigating Novaya Zemlya, that it should be attempted along the *east* coast, as then the current and wind would be more favourable for rounding the north end. In this view I cannot concur, for I am firmly convinced that greater difficulties would be experienced in working up along the east coast, instead of returning by that way. So far as I am able to judge, both wind and current would be adverse whilst going north, whereas the reverse would be the case in coming south.

In 1870 Captain Johannesen, a Norwegian, successfully sailed round Novaya Zemlya; whilst Captain Alve reports, that towards the end of July "the whole of the north coast was free from ice." From Cape Nassau he sailed fifty geographical miles to the north-west without seeing any signs of ice! In the following year their countryman Carlsen visited Ice Haven. All these voyages were performed late in the year.

At the same time that Carlsen was collecting relics at the winter quarters of Willem Barents, Weyprecht and Payer, in the little *Isbjörn*, reached the high latitude of 78° 28′ in the Barents Sea on *the 1st of September!* The ice then, so far as they could see, presented no serious impediment to advance; but, like ourselves, they had to submit to opposition on the part of their Norwegian crew, and were therefore compelled to return.

The next year, 1872, was undoubtedly a bad ice year in the eastern part of the Barents Sea, but I maintain that it was quite an exceptional season; for, amongst all the records we have been able to consult, we fail to find that the ice was ever so far south during the month of August as it was in 1872.

It was then that the *Tegetthoff* was beset in the comparatively low latitude of 76° 22′. But I cannot help thinking that Lieutenant Weyprecht departed from his usual prudence and foresight when he pushed his ship into the pack. Had he waited patiently—and patience is an indispensable requisite for an Arctic explorer—for a few days, the ice would probably have opened, and he and his crew would have been saved from the two long, anxious, and weary winters they were fated to spend in their frozen bondage.

But although the ice was closely packed along the west coast of Novaya Zemlya, the sea was remarkably open to the westward, and all along the east coast of Spitzbergen. In the latter end of July Captain Altmann, of Tromsö, sighted Wiche's

Land, and declared that he had never known the sea so free from ice for the preceding twenty years. In August Captain Neils Johannesen sighted the same island in latitude 78° 10′, and actually anchored there the following day. He found the southern and eastern shores entirely free from ice, but the pack was observed to the northward.

About the same time Captain Nilsen saw the same island. He reports that to the east and north the sea was free of ice, except a chain of bergs which were drifting south.

The crew of the *Tegetthoff*, on their return journey in 1874, reached the open water on the 15th of August, in latitude 77° 49′, thereby demonstrating that that also was a good ice year.

I could mention several other instances to prove that during a late period of the season the Barents Sea is comparatively free from ice, but I think I have already adduced sufficient proof to make this fact palpable. The only year that can be brought forward as a bad one was the year in which the *Tegetthoff* was beset, and this I regard as a purely exceptional one. But it may here be remarked that, although it was a bad season for going north along the coast of Novaya Zemlya, it was an unusually good one along the east coast of Spitzbergen, for it is very rarely indeed that Wiche's Land is ever seen, and never before had it been reached. I do not think we have sufficient data yet to be able to say, with any degree of authority, that because it is unfavourable on one side of the Barents Sea, it is favourable on the other, but the existing evidence would lead us to believe in such a deduction. A further deduction from recorded facts is that when it is a good year for pushing north along the west coast of Novaya Zemlya, it is an indifferent ice year in the Kara Sea, and *vice versâ.*

This may possibly be accounted for by the influence the prevailing winds exert on the pack. For instance, continuous north-westerly winds will pack the ice along the west coast of Novaya Zemlya, and yet clear the east coast of Spitzbergen and the Kara Sea, as was found in 1872; whilst south-easterly winds would have a diametrically opposite result; for it would clear the eastern part of the Barents Sea, and at the same time render the Kara Sea as impenetrable as we found it to be.

The proposal of Commodore Jansen, a very distinguished officer belonging to the Royal Netherlands Navy, and one who has devoted a great deal of time and study to the physical geography of the Arctic regions, more especially as relates to the Barents Sea, should be universally supported. It is that stations should be formed, wherever practicable, along the north coasts of Norway, Lapland, and Siberia, where meteorological observations could be regularly taken. In a very short time, a comparison of these observations, specifying, as they would, the prevailing winds, would assist very materially in deciding when a good ice year, or the reverse, might be expected. These meteorological observatories could be established and kept up at very little cost, whilst the results would be exceedingly valuable in a scientific point of view.

Last year nearly all the channels leading into the Kara Sea were blocked with ice, and several steamers bound to the Yenisei were unable to pass through. But it is a curious fact that, towards the end of August, two vessels did, with great difficulty, actually succeed in passing through Pet Strait, and very shortly after they came into a large open water, in which they navigated as far north as Ice Haven, although thirty miles off the land. Thus again the sea to the northward was open, whilst we, at the same time, saw heavy ice, in which were some enormous floes, pressed up against the eastern shore of Novaya Zemlya.

When we were at Tromsö on our way home, we met there the captain of a Gottenburg steamer, who had just returned from an unsuccessful attempt to reach the Yenisei. He vainly attempted several times to pass through Burrough and Pet Straits, but was always baffled by heavy ice. He then went northwards to the Matyushin Shar, reaching that strait only three days after we had sailed northward with the *Willem Barents;* but, after passing through the channel, he was again stopped by the same ice that we had been contending with. He then abandoned all further attempts and returned to Norway.

The cruise of the *Willem Barents* last year, taken in conjunction with our own trip in the *Isbjörn,* has, I think, taught us a great deal, and it has, in my opinion, opened our eyes considerably to the feasibility of exploration in the direction of Franz Josef Land.

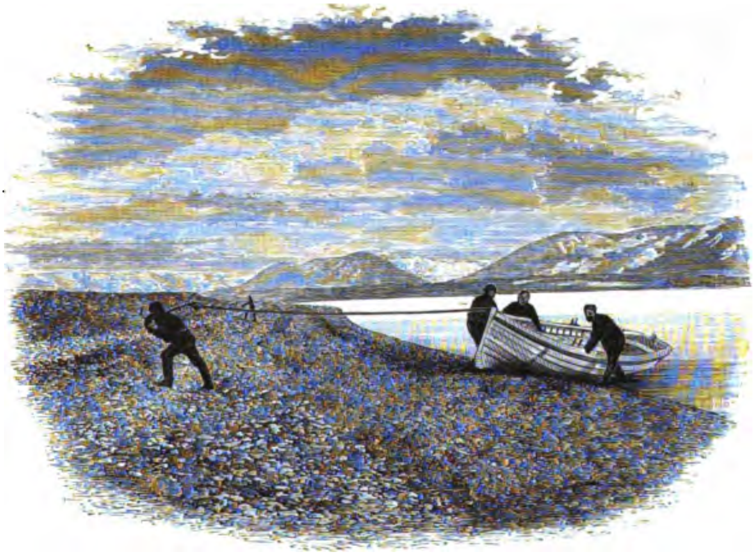
I am decidedly of the same opinion as that intrepid explorer Payer, that the latitude of 78° in the Barents Sea may be reached every year during the months of August and September, when the ice is at its minimum. Therefore, in spite of long nights, that should be the time selected for a dash northwards.

From a careful study of all that has been achieved in the far North, I am more than ever convinced that a greater amount of success will be gained by the exploration of the region in the vicinity of Franz Josef Land than in any other part of the Arctic regions.

This route possesses all the requirements necessary to insure success. It is within three weeks' sail of England; it is, I am confident, easy of attainment for a well-equipped steamer skilfully conducted; it has the rare advantages of having a country south of it, like Novaya Zemlya, where depôts of provisions could be established and boats placed in readiness for the members of the expedition, in case of any unfortunate catastrophe happening to their ship; whilst here is the only land which stretches for an indefinite distance northwards into the unknown region. It is a pretty well established fact amongst Arctic men that so long as there is land, it can be reached. It is only when the land ceases that exploration ends.

If a legitimate expedition leaves our shores, and proceeds by the route I now advocate, the commander should be strictly enjoined that he is on no account to risk failure by attempting the pack, if he finds the ice further south than is anticipated. Should he do so, the fate of the *Tegetthoff* will in all likelihood be his. I know it requires a great deal of moral courage to return and report a failure, but the commander selected should be a man who possesses the moral courage to return and proclaim his defeat. In the following year his wise caution would surely be rewarded. He would then have a very different story to relate, or I very much mistake, and his next report would be one announcing an unprecedented success. The dearest wish of my heart is once more to witness the despatch of a properly equipped and efficiently commanded English exploring Arctic Expedition, when, with the poet, I would exclaim—

"Sail on, nor fear to breast the sea!
Our hearts, our hopes, are all with thee,
Our hearts, our hopes, our prayers, our tears,
Our faith triumphant o'er our fears,
Are all with thee,—are all with thee!"



MATYUSHIN SHAR.

APPENDICES.

A.

NOTES ON THE PLANTS

Collected by Captain A. H. Markham, R.N., in Novaya Zemlya.

BY SIR J. D. HOOKER, K.C.S.I., C.B.

IN the Appendix to Captain Sir G. Nares's "Narration of a Voyage to the Polar Sea during 1875–76," I gave in outline a comparison between the Flora of the coasts of West Greenland and East Grinnel Land, between the parallels of 80° and 83°, and that of Spitzbergen, showing how remarkably they differed in respect of both genera and species. The excellent collection now brought by Captain Markham from Novaya Zemlya, and placed in my hands by that zealous officer, enables me to add some very interesting facts relative to the distribution of plants in the Arctic regions.

Unlike Spitzbergen, the botany of Novaya Zemlya is not approximately well explored; few naturalists have visited it, and the only full account of its Flora is contained in a paper by Dr. Trautvetter, of St. Petersburg, entitled "Conspectus Floræ Insularum Norwaja-Semlja," published in 1871 or 1872 in the *Acta Horti Petropolitani*, vol. i. (1871–73). From the preface to that work, I learn that two voyagers alone had previous to that date made any considerable collections in Novaya Zemlya, namely, the late celebrated naturalist Von Baer in 1837, and the no less celebrated traveller Middendorff in 1870. The number of flowering plants and ferns which they collected is 105, of which one hundred were collected by Baer and forty-one by Middendorff, who obtained only three that were not in Von Baer's herbarium. Captain Markham's collection contains fifty-seven species of flowering plants, and adds one to the Flora, namely, the Arctic and Antarctic grass (*Alopecurus alpinus*), together with the typical form of "Jacob's Ladder" (*Polemonium cœruleum*), of which only a very Arctic and well-marked variety or subspecies (*P. humile*) was known to Trautvetter from specimens, though Von Baer alludes to the typical *P. cœruleum*, in his paper on the vegetation of Novaya Zemlya, as a native of the island.

I. A comparison of the Flora of Novaya Zemlya with that of Spitzbergen is the first that presents itself, when it will be seen that the latter is not so much poorer in species and genera as might be anticipated from its more northern position (by nearly 10°)—76° 30′ to 80° 40′. This is no doubt due to the combined effects of the higher temperature of the Gulf Stream (in the case of Spitzbergen), and the severity of the climate of the coasts of Arctic Asia contiguous to Novaya Zemlya. Their flowering plants are, respectively—Spitzbergen, 96, and Novaya Zemlya, 105;* a difference of only nine in number of species, which is, however, very great when the elements of each Flora are compared, for (exclusive of about ten critical species of such genera as *Draba*, *Poa*, and *Festuca*, as to the limits of the Arctic species of which there is much difference of opinion), I find only about sixty-six common to the two archipelagos!

This difference of the Flora is due principally, as might be supposed, to the more southern latitude of Novaya Zemlya; for it is probably here that the following twenty of the thirty-nine Novaya Zemlya plants not found in Spitzbergen find their northern limit * :—

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* Since writing the above, Dr. Trautvetter has published in the *Acta Hort. Bot. Petropolitani* (vol. i. p. 541), an enumeration of plants collected in Novaya Zemlya by various botanists, in 1870, 1877, and 1879, and in which eight species are added to the list of flowering plants. These are, for the most part, species which here attain their northern limit, and do not affect the comparisons I have drawn between the Novaya Zemlya and other Arctic Floras.

Thalictrum alpinum.
Arabis petræa.
Sedum Rhodiola.
Potentilla sericea.
Valeriana capitata.
Matricaria inodora.
Artemisia vulgaris.
Antennaria carpathica.
Senecio resedifolius.
Trientalis europæa.
Polemonium cœruleum.
Myosotis sylvatica.
Eritrichium villosum.
Pedicularis versicolor.
Salix Myrsinites.
„ glauca.
„ rotundifolia.
Eriophorum vaginatum.
Poa alpina.
Hierochlöe pauciflora.

Of the remaining twenty, five are Asiatic, or forms which would not be expected to extend northwards of Novaya Zemlya, not being found in other Arctic regions contiguous to Spitzbergen :—

Schevereckia podolica.
Hedysarum obscurum.
Pachypleurum alpinum.
Senecio resedifolius.
Eritrichium villosum.

Of the remaining fifteen, nine attain so high a latitude (72°, 78°, and northwards) in North Greenland, etc., that their absence in Spitzbergen is not easily accounted for :—

Cheiranthus pygmæus.
Lychnis affinis.
Vaccinium uliginosum.
Androsace septentrionalis.
Pedicularis sudetica.
Salix arctica.
Carex rigida.
Deschampsia cæspitosa.
Colpodium latifolium.

There remain the following five Novaya Zemlya plants which are absent both in Spitzbergen and North Greenland, but which in other Arctic regions attain as high latitudes as these countries do :—*Caltha palustris*, *Astragalus alpinus*, *Oxytropis campestris*, *Phaca frigida*, *Pleuropogon Sabinii*. Of these five, *Pleuropogon Sabinii*, the scarcest of plants, and the only endemic Arctic genus, is, as far as is known, confined to Melville and the adjacent Polar American islands and Novaya Zemlya. *Caltha* and the *Leguminosæ* are also high Arctic species, whose absence in Greenland and Spitzbergen is one of the enigmas of Arctic vegetation.

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* But the collections made along the shore of the Arctic Asiatic coast north and east of Nova Zembla, during the recent expedition of Nordenskiold, will give much information on this point.

Turning now to the Spitzbergen plants which are absent in Novaya Zemlya, no doubt when the latter country is further explored many or even most of them may be found. Exclusive of the critical species above alluded to, there are twenty-one, including eight genera which I have marked with an * in the following list. All these are Greenlandic, except *Arenaria Rossii* and *Salix reticulata*, both of them otherwise generally distributed Arctic plants; and *Gentiana tenella*, an Asiatic and European species. The prefixed G. indicates the plant being a native of Greenland:—

Arenaria Rossii.
G. Honckneya* peploides.
G. Alsine biflora.
G. Potentilla pulchella.
G. Cassiope* tetragona.
Gentiana* tenella.
G. Mertensia* maritima.
G. Empetrum* nigrum.
G. Kœnigia* islandica.
Salix reticulata.
G. Carex glareosa.
G. Carex nardina.
G. „ rupestris.
„ dioica.[†]
G. Calamagrostis* neglecta.
G. Dupontia psilosantha.
G. Festuca brevifolia.
G. Glyceria* maritima var.
„ augustata.
G. Poa abbreviata.
G. Catabrosa vilfoides.

On the other hand, none of the above Spitzbergen plants are peculiar to Greenland, though, considering their apparent absence in Novaya Zemlya, they have more probably migrated to Spitzbergen from Greenland or from Iceland (where many are found) than from the continent of the Old World.

A curious indication of affinity between the Floras of Spitzbergen and Arctic Greenland is shown in the absence in both of any leguminous plant, and of *Caltha*, though these inhabit all other Arctic areas, and of the *Pleuropogon*, which, as above stated, inhabits Novaya Zemlya to the east, and the Polar islands to the west of them.

[†] Found by the Rev. Mr. Eaton, but by no other botanist.

II. The comparison of the Novaya Zemlya Flora with that of the same latitudes in the coasts of Greenland, Smith's Sound, and the higher regions lately visited by Sir G. Nares's Polar Expedition, presents some curious features. The Flora of this region, as compiled from the list in Rink's "Naturhistorische Bidrag til en Beskrivesse af Grönland," and supplemented by that of the later expeditions up Smith's Sound (see Appendix to Nares's Voyage, vii. p. 301), amounts to 110 species of flowering plants, or five more than Novaya Zemlya contains, but with a greater amount of difference than a comparison of the latter country with Spitzbergen showed, for only about forty-seven are common to both.

Of Novaya Zemlya plants not found in similar latitudes in West Greenland and the adjacent coasts and north of Smith's Sound, there are sixteen species (including thirteen genera), viz. :—

Caltha palustris.
Parrya arctica.
Schivereckia podolica.
Oxytropis sordida.
Astragalus alpinus.
Phaca frigida.
Hedysarum obscurum.
Pachypleurum alpinum.
Valeriana capitata.
Nardosmia frigida.
Senecio resedifolius.
Trientalis europæa.
Polemonium cœruleum (typicum).
„ humile (found in East Greenland).
Myosotis sylvatica.
Eritrichium villosum.
Pleuropogon Sabinii.

The absence of *Schivereckia*, *Hedysarum*, *Pachypleurum*, *Senecio*, *Trientalis*, and *Eritrichium* in West Greenland is not remarkable; for these, though European and Asiatic species, do not occur in Arctic America east of the Rocky Mountains. The absence of the others is not thus accounted for; nor is that of such plants as *Potentilla verna*, *Salix rotundifolia* and *polaris*.

There are also a few Novaya Zemlya plants which in Greenland are confined to its east coast, as *Arabis petræa*, *Saxifraga Hirculus* and *hieracifolia*, *Polemonium humile*, together with a few others, which, though not found on the West Greenland coast north of 72°, occur to the southward of that parallel, namely, *Sedum Rhodiola*, *Chrysosplenium alternifolium*, and *Erigeron alpinus*.

Of the 110 West Greenland and Smith's Sound, etc. species found within the same parallels of latitude as Novaya Zemlya occupies, sixty-three have not hitherto been found in the latter archipelago. These, with the exception of *Vesicaria arctica*, *Potentilla tridentata*, and *Saxifraga tricuspidata*, are all European. The most remarkable features they present are: 1. The number of *Carices*, amounting to twelve species (together with two common to Novaya Zemlya). 2. The number of genera in proportion to species—no less than twenty-three, which here reach a higher, and most of them a very much higher, latitude in Smith's Sound and north of it than in any other meridian. Of these genera only the four with an S. prefixed inhabit Spitzbergen, and the one with M. prefixed the American Polar islands (west of Smith's Sound):—

Vesicaria alpina.
Montia fontana.
Sibbaldia procumbens.
Alchemilla vulgaris.
Epilobium alpinum.
„ tetragonum.
M. Arnica alpina.
Loiseluria procumbens.
Phyllodoce cærulea.
S. Cassiope tetragona.
„ hypnoides.
Pyrola grandiflora.
Diapensia lapponica.
S. Gentiana nivalis.
Bartsia alpina.
Veronica alpina.
S. Empetrum nigrum.
Armeria vulgaris.
Rumex acetosella.
S. Kœnigia islandica.
Betula nana.
Tofieldia borealis.
Kobresia calycina.
Elyna spicata.
Elymus arenarius.

To these may be added the following European species, as attaining their northern limits in West Greenland:—

Stellaria media.
„ humifusa.
„ cerastioides.
Sagina cæspitosa.
Potentilla anserina.
Saxifraga Aizoon.
Sedum villosum.
S. Erigeron uniflorus.
M. Antennaria alpina.
Polygonum aviculare.
S. Salix herbacea.
Carices, various.
S. Glyceria maritima, var. festuæformis.

Comparing, then, the Floras of the three high Arctic meridians of Novaya Zemlya, lat. 70°–77°, long. E. 60°; Spitzbergen, lat. 76½° 80½°, long. E. 20°; West Greenland and Smith's Sound, etc., lat. 71°–82°, long. W. 60°–70°, we find that they present great differences, Greenland being the most remarkable—1. From the number of species of European types it contains which there reach so very high a parallel; 2. From differing more in its Flora from Spitzbergen and Novaya Zemlya than these do from one another; and, 3. From the absence of Arctic *Leguminosæ*, *Caltha*, and various other plants that extend elsewhere around the Arctic circle.* These facts favour the conclusion which I have expressed in the Appendix to Sir G. Nares's narrative (ii. 307), that the distribution of plants in the Arctic regions has been meridional, and that their subsequent spread eastward and westward has not been sufficient to obliterate the evidence of this prior direction of migration. To this conclusion I would now add, that whereas there is no difficulty in assuming that Novaya Zemlya and the American Polar islands have been peopled with plants by migration from the south, no such assumption will explain the European character of the Greenland, and especially the high northern Greenland vegetation, the main features of which favour the supposition that it retains many plants which arrived from Europe by a route that crossed the Polar area itself, when that area was under geographical and climatal conditions which no longer obtain.

CATALOGUE OF SPECIES OF PLANTS COLLECTED IN NOVAYA ZEMLYA BY CAPTAIN MARKHAM.

I. FLOWERING PLANTS (named by Professor Oliver, F.R.S).

1. *Caltha palustris*, L.—Lystina Island.
2. *Ranunculus nivalis*, L.—Lystina Island; north side Matyushin Shar.

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* I have, in the Transactions of the Linnean Society, vol. xxiii. p. 270, and in Nares's "Voyage to the Polar Sea," ii. 303, shown how greatly the North Greenland and Smith's Sound Flora differs also from that of the Polar islands to the west of it.

3. *Ranunculus acris*, L. *forma ?*—Feodora Island.

4. *Papaver nudicaule*, L.—Schubert Bay; Tern Island; Lystina Bay; north side Matyushin Shar; Lystina Island; Brenta Bay.

5. *Cardamine pratensis*, L.—North side Matyushin Shar; Cape Galla; south side Matyushin Shar.

6. *Parrya macrocarpa*, R. Br. (*Matthiola nudicaulis*, Traut.)—North side Matyushin Shar; Feodora Island (white flowers); Schubert Bay.

7. *Braya alpina*, Sternb. (*Sisymbrium alpinum*, Fourn.).—North side Matyushin Shar; Lutke Bay; Lystina Island.

8. *Eutrema Edwardsii*, Br. (*Sisymbrium Edwardsii*, Traut.), (apparently not in good state).—South side Matyushin Shar.

9. *Cheiranthus pygmæus*, Ad. (*Sisymbrium pygmæum*, Traut.).—Schubert Bay; south side Matyushin Shar.

10. *Draba alpina*, L.—Lystina Island; north side Matyushin Shar.

D. alpina, *var. breviscapa.*—Cross Island; Lystina Bay; Tern Island.

11. *Draba alpina*, L. *var. ?* (an. *D. glacialis*, Ad ?).—North side Matyuskin Shar.

12. *Cochlearia fenestrata*, Br.—Lystina Island; Cross Island.

13. *Cochlearia officinalis*, L.—Cape Hessen; Kara Sea.

14. *Cochlearia*, sp. ?—Lystina Island.

15. *Silene acaulis*, L.—Lutke Bay; north side Matyushin Shar; Schubert Bay; south side Matyushin Shar.

16. *Lychnis apetala*, L.—South side Matyushin Shar.

17. *Cerastium alpinum*, L.—Tern Island; Schubert Bay; Lystina Island; north side Matyushin Shar.

Cerastium alpinum, L. *var. glabratum.*—South side Matyushin Shar; Brenta Bay; Feodora Island; Nameless Bay; Lystina Island.

18.—*Cerastium*, sp. ? (flowerless specimen).—Brenta Bay.

19. *Astragalus alpinus*, L.—Schubert Bay; north side Matyushin Shar.

20. *Astragalus* (*Phaca*) *frigidus*, L. *var.*—North side Matyushin Shar; Schubert Bay.

21. *Oxytropis campestris*, D. C., *forma.*—Feodora Island; Lystina Island; north side Matyushin Shar; Lystina Bay.

22. *Dryas octopetala*, L.—North and south sides Matyushin Shar; Cairn Island.

23. *Potentilla frigida*, Vill. ? (small state).—North side Matyushin Shar; Schubert Bay.

24. *Potentilla*, sp. ? (no flower).—Nameless Bay.

25. *Sedum Rhodiola*, L.—North side Matyushin Shar; Feodora Island.

26. *Saxifraga cernua*, L.—Lystina Island; north and south side Matyushin Shar; Feodora Island.

27. *Saxifraga flagellaris*, W.—Tern Island; Cape Hessen.

28. *Saxifraga cæspitosa*, L.—Lystina Island; Feodora Island; Schubert Bay; north and south side Matyushin Shar; Nameless Bay.

29. *Saxifraga nivalis*, L.—Tern Island; Feodora Island.

30. *Saxifraga Hirculus*, L.—Schubert Bay; south side Matyushin Shar.

31. *Saxifraga oppositifolia*, L.—Cairn Bay; Nameless Bay; north side Matyushin Shar; Lystina Island; Cross Island.

32. *Nardosmia frigida*, H. K.—Schubert Bay.

33. *Matricaria inodora*, L.—Schubert Bay; Brenta Bay.

34. *Artemisia borealis*, Pal.—Schubert Bay; Feodora Island.

35. *Artemisia vulgaris*, L. *var. Tilesii*, Led.—Lutke Bay.

36. *Taraxacum officinale* (two varieties).—Schubert Bay; north side Matyushin Shar; Feodora Island; Lystina Island.

37. *Valeriana capitata*, Pall.—Cape Galla.
„ „ (young state).—Schubert Bay.

38. *Polemonium cæruleum*, L.—Cape Galla.

39. *Polemoniun humile*, W.—Schubert Bay; Matyushin Shar, north and south sides; Lutke Bay.

40. *Myosotis sylvatica*, Hoffm., *var. alpestris.*—Lutke Bay; Cape Hessen; Brenta Bay; north side Matyushin Shar.

41. *Eritrichium villosum*, Bge.—Cape Hessen; Feodora Island; Cairn Bay; north side Matyushin Shar.

42. *Pedicularis sudetica*, W.—Schubert Bay; north side Matyushin Shar. Also radical leaves of probably the same in Cairn Bay.

43. *Pedicularis hirsuta*, L.—North and south sides Matyushin Shar.
„ „ ?—Schubert Bay.

44. *Oxyria reniformis*, H. K.—Lystina Island; Tern Island; north side Matyushin Shar.

45. *Polygonum viviparum*, L.—Cape Galla; south side Matyushin Shar.

46. *Salix arctica*, Pall.? *var. glabrata.*—Cape Galla; south side Matyushin Shar.

47. *Salix arctica*, Pall.—Cairn Bay; north side Matyushin Shar.

48. *Salix lanata ?* (barren).—South side Matyuskin Shar.

49. *Salix polaris*, Vahl?—North side Matyushin Shar; Cape Hessen; Cairn Bay (barren).

50. *Luzula hyperborea*, Br., *forma.*—Cape Hessen; and imperfect specimen of same (?), Nameless Bay.

51. *Eriophorum Scheuchzeri*, Hoffm.—Nameless Bay; Cape Hessen; Schubert Bay.

52. *Carex pulla*, Good.?—Cape Galla.

53. *Carex rigida*, Good.?—(Immature.)

54. *Alopecurus alpinus*, *var.*—Schubert Bay (not in Trautvetter's "Conspectus").

55. *Dupontia Fischeri*, Br.—Schubert Bay; south side Matyushin Shar.

56. *Colpodium latifolium*, Br.—South side Matyushin **Shar.**
57. *Festuca ovina*, L. *var. violacea.*—Feodora Island.

II. MOSSES (named by Dr. Berggren).

58. *Aulacomnium turgidum*, Wahl.
59. *Cinclidium stygium*, Sw.
60. *Bryum obtusifolium*, Turn.
61. „ *purpurascens*, R. Br.
62. *Polytrichum strictum*, Menz.
63. *Dicranum elongatum*, Sch.
64. *Leptotrichum flexicaule*, Schl.
65. *Barbula aciphylla*, B. and S.
66. *Racomitrium lanuginosum*, Hedw.
67. *Hypnum nitens*, Timm.
68. „ *abietinum*, L.
69. „ *chryseon*, Schw.
70. „ *splendens*, Hedw.
71. „ *intermedium*, Lindbg.
72. „ *stellatum*, Schreb.
73. „ *uncinatum*, Hedw.
74. „ *callichroum*, Brid.

III. HEPATICÆ (named by Dr. Berggren).

75. *Jungermannia tricophylla*, L.

IV. LICHENS (named by J. G. Baker).

76. *Cetraria nivalis*, L.
77. „ *juniperina*, L.
78. *Cladonia gracilis*, Hoffm.
79. *Dufourea madreporiformis*, Wulf. (We have this before only from the Swiss Alps.)
80. *Stereocaulon denudatum*, Flörke.
81. *Peltigera canina*, L.
82. „ *aphthosa*, Linn.
83. *Umbilicaria polyphylla*, Linn.
84. „ *erosa*, Weber.
85. *Solorina crocea*, Linn.
86. *Lecanora ventosa*, Linn.
87. *Squamaria murorum*, Hoffm.
88. *Lecidea geographica*, Linn.

5. FUNGI.

89. *Agaricus*, sp.

B.

NOTE ON THE BIRDS

Collected by Captain A. H. Markham, R.N.

BY CAPTAIN H. W. FEILDEN, F.G.S., C.M.Z.S.

ON the return of Captain A. H. Markham, R.N., from a cruise in Barents Sea and to Novaya Zemlya during the summer and autumn of 1879, he placed in my hands, for examination, his ornithological collection, consisting of some sixty well-preserved birds' skins, comprising twenty-six different species. These were procured by him on the shores of Novaya Zemlya, or on the adjacent seas, but all the species obtained have been observed in that area by preceding voyagers, with the exception of one, *Ruticilla Wolfi*, Brehm.

The following is a list of the birds submitted to me, with some notes on their distribution derived from observations made by Captain Markham. Most of these specimens are now in the collection of Sir Henry Gore Booth, Baronet.

1. NYCTEA SCANDIACA. Snowy owl.

Recorded by Markham as common, and found nesting on the shores of Matyushin Shar. Several pellets, or castings, of these birds, brought from a nest situated in the above locality, were examined by me, and found to be composed exclusively of the remains of lemmings, referable to two species, *Myodes torquatus* and *Myodes obensis*.

2. RUTICILLA WOLFI. Wolf's bluethroat.

The specimen procured, which was captured on board the *Isbjörn* in N. lat. 70° 6′, E. long. 48° 40′, about midway between the island of Kolguef and the south-western coast of Novaya Zemlya, can only be considered an accidental straggler. As this specimen has the throat-patch entirely blue, I have applied the specific name given to this form by the eldest Brehm (" Beiträge," ii. p. 173).

3. PLECTROPHANES NIVALIS. Snow bunting.

Abundant in Matyushin Shar and elsewhere ; observed by Markham nesting on Cross Island, N. lat. 76°.

4. OTOCORYS ALPESTRIS. Shore lark.

Commonly distributed. Nests and eggs taken on the 25th of June in Matyushin Shar, at an elevation of five hundred feet, from amongst stones.

5. TRINGA STRIATA. Purple sandpiper.

Common, evidently breeding, but nest not found.

6. STREPSILAS INTERPRES. Turnstone.

Apparently rather rare in Novaya Zemlya. Markham observed three, and obtained one, in Matyushin Shar, on the 24th of August.

7. ÆGIALITIS HIATICULA. Ringed plover.

Common, especially in Matyushin Shar and along the east coast. Its eggs were procured.

8. STERNA MACRURA. Arctic tern.

Appears to be a common species, but scarcer on the east coast and Kara Sea, than on the west coast. A colony of Arctic terns was found breeding at Lystina Harbour, and others on some of the islands of the Pankratjew group, whilst Markham describes them as breeding by hundreds in Russia Bay when he visited that place on the 31st of August.

9. PAGOPHILA EBURNEA. Ivory gull.

Rare on the east coast, only three examples having been seen there in as many weeks. Observed now and again in Matyushin Shar, but numerously distributed along the west coast and extreme north of Novaya Zemlya. One of the species noticed, in considerable numbers, at the most northern position reached by the *Isbjörn*, N. lat. 78° 7′, E. long. 46° 53′, on the 12th of September.

10. RISSA TRIDACTYLA. Kittiwake.

A very common species on the west coast of Novaya Zemlya. A single example observed by Markham in Matyushin Shar on the 21st of June. Found breeding, and eggs obtained at Lystina Harbour on the 3rd of July. At the end of August and beginning of September, kittiwakes were abundant at Russia Bay, and northwards they were observed around the *Isbjörn* in considerable numbers, at the highest latitude obtained.

11. LARUS GLAUCUS. Glaucous gull.

A common species, both on the west and east coast of Novaya Zemlya. It breeds in considerable numbers on the isolated "stacks" which lie off many of the headlands and promontories of the east coast. The glaucous gull was also one of the species observed around the vessel at her most northern position.

12. STERCORARIUS POMATORHINUS. Pomatorhine skua.

Frequently observed, both in Matyushin Shar and along the east and west coasts. Very numerous off the Pankratjew Islands, 13th of July.

13. STERCORARIUS CREPIDATUS. Richardson's skua.

Apparently not so common as the next species. Found nesting at Lystina Harbour.

14. STERCORARIUS PARASITICUS. Buffon's skua.

Is a very common species, and was frequently found by Markham, breeding, but not in colonies. On the 4th of August he shot the parent birds, and took half-fledged young from their nest, in Schubert Bay on the east coast. This has given me my first opportunity of examining the young of the long-tailed skua in nestling plumage. The mottling of the foot and tarsus in the nestling is very conspicuous. These interesting specimens are now in the collection of Mr. Howard Saunders.

15. ALCA BRUENNICHI. Brünnich's guillemot.

A very abundant species; in some places breeding in countless numbers. Markham describes a "loomery," on the south shore of Nameless Bay, where he and a companion bagged six hundred in two hours' shooting.

16. URIA MANDTI. Mandt's dovekie.

This guillemot appears to be common on both the east and west coasts, also in Matyushin Shar. The eggs of this species, as far as my experience goes, are not distinguishable from those of *Uria grylle*.

17. MERGULUS ALLE. Little auk.

Tolerably common on the west coast to the northwards of Berg Island, but scarce on the east coast. Markham records having seen but three examples in the Kara Sea.

18. COLYMBUS ARCTICUS. Black-throated diver.

Markham makes mention of large divers being common on the west coast as far north as Cape Nassau, and it is possible that amongst them may have been *C. glacialis*, but the specimen brought away belongs to this species.

19. COLYMBUS SEPTENTRIONALIS. Red-throated diver.

Obtained in Russia Harbour on the 4th of September.

20. FULMARUS GLACIALIS. Fulmar petrel.

Common on the western and northern coasts of the north island, and one of the species observed in the highest latitude attained. Not seen by Markham in the Kara Sea.

21. ANSER SEGETUM. Bean goose.

This is an abundant species in Novaya Zemlya, especially in Matyushin Shar and along the east coast. Specimens were secured by Markham on the 27th of July in Matyushin Shar, and again on the 2nd of August—on the latter occasion from a flock of two hundred, many of which were unable to fly through moulting. The length of the bill in the specimens brought home is quite normal.

22. Bernicla brenta. Brent goose.
Common on both sides of the north island.

23. Harelda glacialis. Long-tailed duck.
Observed in Lemming Harbour by Markham, and some eight or ten seen in Matyushin Shar, but none further north.

24. Somateria mollissima. Eider duck.
Common, more especially on the west coast, north of Matyushin Shar.

25. Somateria spectabilis. King eider.
Common in Matyushin Shar and to the southwards, but, according to Markham, replaced to a great extent by *S. mollissima* to the northwards.

26. Mergus serrator. Red-breasted merganser.
Only observed by Markham in Matyushin Shar; about a dozen examples seen in the aggregate.

In addition to these recorded species, specimens of which were brought to England, the following were recognized:—A swan, most probably *Cygnus Bewicki*, an example of which was shot on the 17th of June at Nameless Bay, but lost; again two swans were seen by Sir H. Gore Booth in Matyushin Shar on the 25th of June; golden plovers (*Charadrius pluvialis*) were recognized by the same gentleman at Lystina Harbour on the 6th of July; and a puffin, in all probability *Fratercula glacialis*, was seen in Matyushin Shar, July 22, and another example was identified on the 12th of September in N. lat. 78°.

The ornithology of Novaya Zemlya has received considerable elucidation of late years, but as its literature is somewhat scattered, I take this opportunity of bringing together a list of the authors and their writings, as far as I am acquainted with them.

In priority we have the zoological results of the explorations made in 1837 by Dr. K. E. von Baer, originally published under the title of "Vie animale à Nowaïa Zemlia," in the *Bull. Sc. de l'Acad. de St. Pétersb.* (iii. pp. 343–352). This paper was republished in the *Archiv für Naturgeschichte*, 1839 (i. pp. 160–170), and translated into English and printed in *Ann. Nat. Hist.* (1st Ser., iv. pp.

145–154), likewise in the *New. Phil. Journ. Edin.* 1840 (xxviii. pp. 93–103).

Between the years 1832 and 1836, the enterprising Russian, Lieutenant Pachtussoff, carried out a series of explorations which are discussed in the body of this book. His reports, published in "Sapiski des Hydrographischen Departements des Ministeriums" (i. pp. 216–220), contain, according to Spörer, "Nowaja Semlä in Geograph. Naturhist. und Volkswirth schaftlicher Beziehung" (Gotha, 1867), some notices of birds, but under their Russian and Samoyed names. Reference may also be made to Spörer's "Das Thierlieben auf Novaja Zemlja," *Lotos. Prag.* 1868 (xviii. p. 47).

In the year 1870, Mr. George Gillett, F.L.S., made a voyage to Novaya Zemlya, and the result of his ornithological researches is published in the *Ibis* for 1870 (pp. 303–310).

In the following year the well-known traveller and naturalist, Dr. Th. von Heuglin, visited Novaya Zemlya for scientific purposes. A paper giving the result of his ornithological investigations appeared in the *Ibis* for 1872 (pp. 60–65); another, "Nachrichten über Novaja-Semlja," *Bull. Ac. Imp. St. Pétersb.* (xvi. p. 566) and *Mél. Biol.* (viii. pp. 220–225, 1872), and "Nachtrag zur Orn. von Novaja-Semlja und der Waigatsch-Insel," *Journ. fur Orn.* 1872 (p. 464), also "Reisen nach dem Nordpolarmeer in 1870 and 1871" (Braunschweig, 1874).

Count Wilczek, who sailed to Novaya Zemlya in 1872, and accompanied the Austrian expedition in the *Tegetthoff* as far as Cape Nassau, made an ornithological collection, which on his return to Austria he presented to the Imperial and Royal Zoological and Botanical Society of Vienna. This collection was described by Herr von Pelzeln, "Vogel von Novaja-Semlja," in *Verhandl. d. Zoolog. Botan. Ges. Wien* (xxiv. 1874, pp. 30, 31).

The Swedish expedition of 1875 to Novaya Zemlya and the Yenisei was accompanied by Dr. Hjalman Théel. This naturalist published a critical account of the bird-fauna of Novaya Zemlya, "Nagra bidrag till Novaya Zemlyas fogel-fauna," in *Ofvers. af Kongl. Vet. Akad.* (Stockholm, 1876), and "Note sur les oiseaux de la Nouvelle Zemble," in *Ann. Sci. Nat.* ($6^{\text{me.}}$ Ser. Zool. tome iv., Art. No. 6, pp. 1–7).

Reference may also be made to Palmén's "Finlands Foglar" (ii. p. 339, 1873), where a grey goose from Novaya Zemlya is described as *Anser rufescens*, Brehm.

From the above enumerated sources and Captain Markham's collection I have compiled the following list of the avifauna of Novaya Zemlya and Waigats. I have omitted three species that have been recorded from that region, as so far their presence in Novaya Zemlya does not appear to be altogether satisfactorily established; these are *Falco gyrfalco*, *Lagopus*, sp.? and *Cygnus musicus*. On the other hand, *Hirundo rustica*, which was observed by Mr. Gillett, is so unmistakable a species, that I have retained it in the list, though no specimen was obtained by that gentleman.

Nyctea scandiaca, L.	Common.
Falco peregrinus, Tuns.	One example, South Island (Pelzeln).
Haliaëtus albicilla, L.	One example, on Waigats (Théel).
Ruticilla Wolfi, Brehm.	One example, at sea (Markham).
Anthus cervinus, Pall.	Not uncommon.
Plectrophanes nivalis, L.	Common.
„ *lapponica*, L.	On Waigats (Théel).
Otocorys alpestris, L.	Common.
Hirundo rustica, L.	Two seen, North Island (Gillett).
Calidris arenaria, L.	On Waigats (Heuglin).
Tringa striata, L.	Common.
„ *alpina*, L.	Common.
„ *minuta*, Leisler	Common.
Strepsilas interpres, L.	Scarce.
Eudromias morinellus, L.	Scarce, Matyushin Shar (Gillett).
Ægialitis hiaticula, L.	Common.
Charadrius pluvialis, L.	Not uncommon.

Phalaropus hyperboreus, L. ...	Waigats (Heuglin and Théel).
Sterna macrura, Nau.	Common.
Pagophila eburnea, Phipps	Common, west coast.
Rissa tridactyla, L.	Very common.
Larus glaucus, Müll.	Common.
„ *leucopterus*, Faber	One example (Pelzeln).
„ *marinus*, L.	Straits of Yugorski (Théel).
Stercorarius pomatorhinus, Temn. ...	Common.
„ *crepidatus*, Gm. ...	Not uncommon.
„ *parasiticus*, L. ...	Abundant.
Alca Bruennichi, Sab.	Very abundant.
Uria Mandti, Licht.	Common.
Mergulus alle, L.	Common.
Fratercula glacialis, Leach ...	Not common.
Colymbus glacialis, L.	*Fide* (Gillett and Heuglin).
„ *septentrionalis*, Latham ...	Not rare, Russia Bay (Markham).
„ *arcticus*, L.	North Island (Markham).
Fulmarus glacialis, L.	Common on west coast.
Anser segetum, Gm.	Common.
Bernicla brenta, Pallas	Common.
Cygnus Bewicki, Yarrell	Scarce (Théel).
Anas Penelope, L.	One example (Heuglin).
Harelda glacialis, L.	Not uncommon.
Œdemia nigra, L.	Not uncommon (Heuglin).
„ *fusca*, L.	Not uncommon (Heuglin).
Somateria mollissima, L.	Common.
„ *spectabilis*, L.	Common.
Mergus serrator, L.	Not rare.

C.

NOTE ON THE CRUSTACEA

Collected by Captain A. H. Markham, R.N.

BY EDWARD J. MIERS, F.L.S., F.Z.S.

THE Crustacea collected by Captain Markham, although not numerous, and belonging for the most part to well-known species, are of interest as having been obtained in a region hitherto almost unvisited by the naturalist, and on this account tending to fill up the *lacunæ* in our knowledge of the geographical range of the species. No doubt, if larger opportunities had offered for dredging, the number of species obtained would have been much greater. In all eighteen species were collected. The synonyma of most of these having been cited in my report on the Crustacea obtained by the British Arctic Expedition in 1875–76, and in other recent memoirs, among which must be particularly mentioned Professor S. I. Smith's very valuable and exhaustive "Report on the Crustaceans of the Atlantic Coast of North America, north of Cape Cod," published in *Trans. Conn. Acad. Sci.*, v. (Part I., 1879), I have not generally thought it necessary to reproduce them in the following list. Perhaps the most interesting of the species obtained by Captain Markham is the *Idotea bicuspida*, Owen —a species which was described and well figured by its distinguished author nearly forty years ago, in the report on the zoology of Captain Beechey's voyage of the *Blossom*, but has not been received with any of the recent collections from the Arctic and Northern Seas.

DECAPODA.

Hyas araneus, Linn.

Nameless Bay, eight fathoms, an adult male ; the same locality, at five fathoms, four younger males. Fragments of a large specimen are in the collection, taken at a distance of two hundred feet from the beach, and at an altitude of fifty feet above the sea-level.

Eupagurus Kröyeri.

Pagurus pubescens, Kröyer, "Crust. in Gaimard Voy. en Scandinavie," Atlas, Pl. II. Fig. 1 ; *nec Nat. Tidsskr.*, ii. p. 251 (1839); Miers, *Ann. Mag. Nat. Hist.* (4th Ser.), xix. p. 132 (1877).

Eupagurus Kröyeri, Stimpson, *Ann. Lyc. New York*, p. 89 (1862); S. I. Smith, *Trans. Conn. Acad.*, v. p. 48 (1879).

? *Eupagurus trigonocheirus*, Stimpson, *Proc. Ac. Nat. Sci. Phil.*, p. 249 (1858).

Nameless Bay, five fathoms, female with ova, inhabiting a whelk shell (*Buccinum*), latitude 73° 10′ N., longitude 53° E., one specimen. A very young hermit-crab from Berg Island, lat. 75° 50′, four fathoms, also apparently belongs to this species.

To this species, which is very nearly allied to *E. pubescens*, but which is apparently distinguished by its more hairy chelæ (the left-hand one having a slightly concave outer margin and slenderer fingers, and being armed above with a carina furnished with a single series of denticules,) I refer the examples from Spitzbergen formerly named *E. pubescens*, also specimens from Greenland (Holboll), and a well-grown example from Burnmouth, Berwickshire (J. Hardy, Esq.), and several from Norway (R. McAndrew, Esq.) It appears useful to mention these localities, as hitherto the distribution in Europe of *E. Kröyeri* has been little known, on account of this species having been confounded with *E. pubescens*.

The *Eupagurus trigonocheirus* of Stimpson, which appears to be scarcely distinguishable except by the more robust and shorter chelæ of the anterior legs, is probably only a variety of the *E. Kröyeri*. There is in the Museum collection a specimen named by Dr. Stimpson from Behring Straits, and others without definite locality.

Craugon (*Cheraphilus*) *boreas*, Phipps.

Two small examples were collected in Lystina Bay, at a depth of five fathoms.

Sabinea septemcarinata, Sabine.

One specimen is in the collection, taken from the stomach of a Greenland seal in the Matyushin Shar.

Professor Smith, in his "Report on the Crustaceans of the Atlantic Coast of Northern America," distinguishes two species which had hitherto been confounded under the name of *Sabinea septemcarinata*. The specimen from the Matyushin Shar belongs to the typical *S. septemcarinata*, which is distinguished by the rostrum being short and obtusely rounded at the tip, and by the terminal post-abdominal segment being subtruncated at its distal end. The body-cavity of this specimen was almost entirely filled by a Nematoid worm.

I may observe that all the specimens in the British Museum collection, collected by the late Arctic Expedition and mentioned in my report, also specimens from Spitzbergen (Eaton), Greenland (Holboll), and Beechey Island (Dr. Lyall), belong to the true *S. septemcarinata*. Of the allied species, *S. sarsi*, Smith, with acutely pointed rostrum and telsum, I have seen no specimens.

Hippolyte Gaimardi, Milne Edwards.

One specimen was collected at Berg Island, in lat. 75° 50′, at a depth of four fathoms. The rostrum is $\frac{7}{6}$-toothed. The specimen is a male, and the third post-abdominal segment is armed with a convex prominence, which, however, is scarcely carinated.

Hippolyte Phippsii, Kröyer.

Of this species but a single specimen was collected in Lystina Bay, at a depth of five fathoms; it is an adult female with ova, exhibiting all the characteristics of that sex, which had been supposed by Kröyer to be a distinct species, and was as such described by him under the name of *H. turgida*. Professor Smith, however, in his recent report, confirms Goes' supposition that *H. Phippsii* and *turgida* are only male and female of the same species, and that, as in the case of *Hippolyte polaris*, the younger males are scarcely distinguishable from the females. As both these authors had before them large series of specimens, I accept their determinations, notwithstanding the statement of Buchholz ("Die Zweite Deutsche Nordpolarfahrte," Cr. p. 274) that he had examined two males of large size exhibiting the characters of *turgida*, and that consequently the characters could not be regarded as sexual, and by which I was led, in my report on the Crustacea of the Arctic Expedition, to regard the two forms as distinct.

Hippolyte polaris, Sabine.

One specimen was collected in lat. 73° 10′ N., long. 53° E., at a depth of thirty fathoms. This specimen is a female, and of the *polaris* form characteristic of that sex.

Professor S. I. Smith, who had observed a very complete series, establishing a complete transition between *H. borealis* and *polaris*, has shown conclusively that the two are but male and female of the same species. Consequently, the statement of Buchholz ("Die Zweite Deutsche Nordpolarfahrte," p. 275) that he had observed males and females of *H. polaris* in nearly equal number seems to have been based on some unaccountable error of observation.

SCHIZOPODA.

Mysis oculata, O. Fabr.

One specimen was obtained at Cross Island, at a depth of five fathoms.

ISOPODA.

Idotea bicuspida.

Idotea bicuspida, Owen, "Crust. in Zoology of Captain Beechey's Voyage," p. 92, Pl. XXVII. Fig. 6. (1839).

Idotea marmorata, Packard, *Mem. Boston Soc. Nat. Hist.* (Part II.) p. 296, Pl. VIII. Fig. 6 (1867).

A series of six individuals, adult and young, of this fine species was obtained in the Matyushin Shar, at a depth of ten fathoms. The ground-colour in the specimens preserved in spirit is a pale olive; the segments are blotched with purplish-red in the middle line and towards the lateral margins. In the broad and somewhat oval form of the body, this species has much affinity with an Antarctic form, the *Edotea magellanica*, Guérin, but differs in the external antennæ, which are of the form usual in *Idotea.*

I have little doubt of the correctness of the citation I have given above of *I. marmorata*, Packard, as synonymous with *I. bicuspida*, although the body is represented in Packard's figure as proportionately somewhat narrower. This species was dredged in seven fathoms on a sandy bottom at Sloop Harbour, in Kynctarbuck Bay, on the coast of Labrador. It is possible that the *Idotea rugulosa* of Buchholz from Spitzbergen ("Cr. in die Zwte. Deutsche Nordpolarfahrte," p. 285) must also be referred to it.

AMPHIPODA.

Anonyx nugax, Phipps.

Several specimens, adult and young, were collected in the Matyushin Shar, at a depth of nine fathoms, and in Nameless Bay, at five fathoms.

Amathilla Sabinii, Leach.

A specimen was collected at Cross Island, at five fathoms, and another at Nameless Bay, at the same depth. Length, about two-thirds of an inch. The flagella of the antennules, the dactyli of the thoracic limbs, and the rami of the pleopoda are reddish, and the dorsal surface of the segments of the body is mottled with the same colour; the ground-colour of the animal is light amber. These specimens are of the typical form of the species, in which all the segments of the body are dorsally carinated.

Amathilla pinguis, Kröyer.

A specimen was collected in Schubert Bay in the Kara Sea, at a depth of three fathoms, and two at Berg Island, lat. 75° 50′, at a depth of four fathoms.

Tritropis aculeatus, Lepechin.

A single specimen was taken from the stomach of a Greenland seal in the Matyushin Shar.

Atylus carinatus, Fabr.

An adult female was obtained at a depth of three fathoms in Schubert Bay, Kara Sea. Numerous young individuals were in the broad pouch. The rostrum is less developed in the females of this species than in males of the same size.

Podocerus anguipes, Kröyer.

Two specimens, females, were collected in lat. 73° 10′ N., long. 53° E., at a depth of thirty fathoms.

Caprella septentrionalis, Kröyer.

Two examples were obtained at Cross Island, at a depth of five fathoms.

CIRRIPEDIA.

Balanus porcatus, Da Costa.

A cluster of about a dozen specimens was obtained in lat. 73° 10′ N., long. 53° E., at a depth of thirty fathoms.

Balanus crenatus, Bruguière.

Several specimens, attached to a whelk shell (*Buccinum*), were obtained with the preceding species.

D.

LIST OF MOLLUSCA

Collected by Captain A. H. Markham, R.N., off Novaya Zemlya.

BY EDGAR A. SMITH, F.L.S., F.Z.S.

THE collection consists of twenty-five species, all of them, with the exception of an *Eolis*, being well-known Arctic forms. However, the following list may be of some value in extending our knowledge of the geographical distribution of species. The specimens themselves are in many instances in very bad condition.

1. *Fusus* (*Sipho*) *tortuosus*, Reeve.—Hab. Lystina Island.

A single dead shell of rather large dimensions.

1*a*. *Buccinum Grœnlandicum*, Chemnitz.—Hab. Lystina Harbour, four fathoms.

2. *Buccinum tenue*, Gray ("Zool. Beechey's Voyage," p. 128, Pl. 36, Fig. 19).—Hab. Lystina Bay, five fathoms. Icy Cape (Gray), Davis Straits (Jeffreys).

3. *Natica affinis*, Gmelin.—Hab. Matyushin Shar, ten fathoms.

4. *Trochus* (*Margarita*) *striatus*, Broderip and Sowerby (*Zool. Journ.*, 1829, vol. iv. 371. *S. cinereus*, Couthony, *Bost. Jour. Nat. Hist.*, 1838-9, vol. ii. p. 99).—Hab. Matyushin Shar, ten fathoms; Lystina Bay, five fathoms; lat. 70° 10′ N., 53° E. long, thirty fathoms, west of Novaya Zemlya.

5. *Trochus* (*Margarita*) *undulatus*, Sowerby.—Hab. Berg Island, lat. 75° 50′ N., four fathoms.

The single shell, which appears to be a variety of this species, has the last whorl somewhat contracted, the base more strongly lirated than usual, and the umbilicus a trifle narrower than in the normal form.

6. *Trochus* (*Margarita*) *umblicalis*, Brod. and Sowb. *var.*—Hab. Lystina Bay, five fathoms.

There are two specimens of a very pretty variety of this species. They are of a reddish colour, less widely umbilicated, and more elevated in the spire than in typical examples.

7. *Trochus* (*Margarita*) *helicina*, Fabricius.—Hab. Berg Island, lat. 75° 50′ N., four fathoms.

8. *Tectura testudinalis*, Müller.—Hab. Cairn Bay, Matyushin Shar.

9. *Chiton* (*Tonicia*) *marmoreus*, Fabricius.—Hab. lat. 73° 10′ N., long 53° E., thirty fathoms; also Berg Island, four fathoms.

10. *Dendronotus arborescens*, Müller.—Hab. Berg Island, lat. 75° 50′ N., four fathoms.

11. *Eolis*, sp.?—Hab. Lystina Bay, five fathoms.

Three specimens of a species of *Eolis* were obtained at the above locality. In spirit the branchiæ are of a yellowish olive colour, with opaque white tips. The sole of the foot is more yellow.

12. *Cyprina islandica*, Linn.—Hab. South Solmenjew Bay.

13. *Cardium Grœnlandicum*, Chemnitz.—Hab. Matyushin Shar, ten fathoms.

14. *Cardium islandicum*, Linn.—Hab. Solmenjew Bay and South Solmenjew Bay.

15. *Leda pernula*, Müller.—Hab. Matyushin Shar, ten fathoms.

16. *Saxicava arctica*, Linn.—Hab. 73° 10′ N. lat., 53° E. long., thirty fathoms; also Nameless Bay, north side, three hundred yards from the beach, at a height of seventy-five feet above sea-level.

17. *Mya arenaria*, Linn.—Hab. South Solmenjew Bay.

There is but a single left valve in the collection. It is much more acuminate anteriorly than usual, and in form is very like *M. japonica* of Jay.

18. *Astarte arctica*, Gray.—Hab. Matyushin Shar, ten fathoms; Nameless Bay, 150 feet above sea-level, at a distance of two hundred yards from the beach; Tern Island; Lystina Harbour; South Solmenjew Bay.

Judging from the specimens from the above localities, the muscular scars appear to be subject to considerable variation in size.

19. *Astarte semisulcata*, Leach.—Hab. Solmenjew Bay.

20. *Astarte striata*, Leach.—Hab. Matyushin Shar, ten fathoms, and Lystina Bay, five fathoms.

21. *Modiolaria lævigata*, Gray.—Hab. Cairn Bay, Matyushin Shar, and Lutke Bay, 4½ fathoms.

22. *Arca glacialis*, Gray.—Hab. Lutke Bay, 4½ fathoms.

23. *Pecten islandicus*, Chemnitz.—Hab. South Solmenjew Bay.

24. *Pecten* (*Pseudamusium*) *Grœnlandicus*, Sowerby.—Hab. Lutke Bay, 4½ fathoms.

E.

LIST OF THE ECHINODERMATA

Collected by Captain A. H. Markham, R.N., in his Voyage to Novaya Zemlya.

BY F. JEFFREY BELL, M.A.

I. HOLOTHURIOIDA.

1. *Myriotrochus rinkii*, Steenstrup.—Two small specimens, taken at a depth of five fathoms in Lystina Bay.

II. OPHIUROIDA.

2. *Ophioglypha nodosa*, Lütken.—Four specimens, taken in Nameless Bay at a depth of eight fathoms.

3. *Ophiopholis aculeata*, O. F. M.—One specimen, taken at a depth of thirty fathoms, lat. 73° 10′, long. 53°.

III. ECHINOIDA.

4. *Strongylocentrotus drobachiensis*, O. F. M.—One specimen, of fair size, from the same station as No. 3.

F.

NOTES ON RHIZOPODA

Obtained from Captain Markham's Soundings on the Shores of Novaya Zemlya.

BY HENRY B. BRADY, F.R.S.

THE results of the examination of eleven samples of the sea-bottom, obtained by Captain Markham on his recent trip to Novaya Zemlya and Barents Sea, may be summed up in a few words. The quantity of material was in every case very small: three of the samples weighed individually less than five grains before washing, and the whole eleven would hardly have filled a one-ounce pill-box. The lists of species, therefore, cannot be regarded as even approximately complete, though collectively they serve to indicate the general aspect of the Rhizopod-fauna of an area concerning which nothing was previously known.

Four of the soundings contained no Foraminifera, and of these, three showed no evidence of animal or vegetable life of any sort; the remaining seven were labelled as follows:—

1. "Soundings, ten fathoms, Matyushin Shar, June 21st, 1879."
2. "Ditto ditto June 24th."
3. "Soundings (no depth given), Cairn Bay, Matyushin Shar."
4. "Soundings, fifteen fathoms, north side Matyushin Shar, July 28th."

These four batches may be considered collectively as representing the bottom fauna of the Matyushin Shar at a depth of from ten to fifteen fathoms. The sample without memorandum of depth differs in no particular from the rest. The Matyushin Shar (spelt in Stieler's "Hand Atlas" Matotschkin Schar) is the strait dividing the two islands that together form Novaya Zemlya, the latitude being about 73° N.

Mineralogically the soundings were very much alike. They were dark-coloured more or less muddy sands, consisting of flattish felspathic grains, with a small proportion of white angular siliceous particles. Foraminifera were present in all four specimens, but abundant in none; there were also a few Ostracoda and small fragments of Polyzoa, Ophiurids, and Echinoderms.

The following is a list of the Foraminifera obtained. The undescribed species of *Reophax* is a straight, compressed, many-chambered, *Lingulina*-like form.

Cornuspira involvens, Reuss.
Biloculina ringens, Lamk.
Miliolina seminulum, Linné.
  „ *agglutinans*, D'Orb.
Hippocrepina indivisa, Parker.
Hyperammina elongata, Brady.
Reophax nodulosa, Brady.
  „ *fusiformis*, Will.
  „ sp. ined.
Haplophragmium canariense, D'Orb.
Trochammina squamata, P. & J.
Verneuilina polystropha, Reuss.
Polymorphina compressa, D'Orb.
Cassidulina lævigata, D'Orb.
  „ *crassa*, D'Orb.
Discorbina, sp.
Truncatulina lobatula, W. & J.
Pulvinulina Karsteni, Reuss.
Nonionina umbilicatula, Mont.
  „ *asterizans*, F. & M.
Polystomella striato-punctata, F. & M.

The three remaining soundings are from somewhat greater depths, and their examination has yielded but a poor list of species. Whether this arises from the smaller quantity of material secured, or from the less plentiful distribution of animal life, may be difficult to decide, but the former is the more probable explanation.

5. "Soundings, June 19th, lat. 73° 10′ N., long. 50° E., thirty fathoms." Clean silicious sand with dark felspathic grains; contained but little evidence of animal life. There

were a few Rhizopoda, belonging to half a dozen species, namely :—

Miliolina seminulum, Linné.
Verneuilina polystropha, Reuss.
Truncatulina lobatula, W. & J.
Pulvinulina Karsteni, Reuss.
Nonionina scapha, F. & M.
Polystomella striato-punctata, F. & M.

6. "Soundings, lat. 70° 45′ N., long. 47° E., eighty fathoms." The material in this case consisted only of a pellet of mud weighing about five grains, which after washing scarcely left a residuum of a grain in weight. This, however, yielded specimens of two arenaceous species :—

Haplophragmium glomeratum, Brady.
Haplophragmium canariense, D'Orb.

7. "Soundings, lat. 74° 16′ N., long. 53° 50′ E., ninety fathoms." Quantity of material not much greater than the last, contained the following forms :—

Haplophragmium glomeratum, Brady.
Cassidulina crassa, D'Orbigny.
Nonionina asterizans, F. & M.
„ *Labradorica*, Dawson.

Incomplete as the foregoing lists of species manifestly are, they suggest several points of interest to the naturalist. Comparing the Rhizopod fauna they represent with that of areas already investigated, a somewhat striking analogy, so far as it goes, may be observed to the results obtained by Dr. G. M. Dawson from the examination of dredgings from the Gulf of St. Lawrence and the coast of Labrador. The material does not afford sufficient basis for detailed comparison, nor would such an analysis possess much general interest. It is just worth observing, with respect to one rather important species, *Hippocrepina indivisa*, that, until it was obtained by the Rev. A. M. Norman on the coast of Norway a year or two ago, it had not been found, except in the habitat originally recorded by Dr. G. M. Dawson, namely, Gaspé Bay at the mouth of the river St. Lawrence.

G.

REMARKS BY MR. ETHERIDGE ON THE GEOLOGICAL COLLECTION

Made by Captain A. H. Markham, R.N.

On his return, Captain Markham requested me to examine his geological collection, knowing that I had done the same with the collection brought home by Sir George Nares. Specimens were brought home by Captain Markham from thirteen or fourteen localities in Novaya Zemlya. Three of those are extremely rich in carboniferous fossils, and, curiously enough, they agree almost species by species with those obtained by Sir George Nares and Captain Feilden, at Cape Joseph Henry in latitude 82° 45′. The value of such specimens is greatly enhanced when they can thus be correlated with others from different regions. The result is that it may now be safely affirmed that the greater portion of the Polar region is composed of carboniferous rocks, and that the greater part of the Polar Sea north of Franz Josef Land and Spitzbergen probably covers a large area of coal measures. The connection of Spitzbergen with the great range of the Ural Mountains can now be shown, and the beds found there can be correlated with the beds in Baffin Bay and Grinnell Land, so that a distinct belt of carboniferous and Devonian rocks circles much of the Polar region. It is in consequence of these expeditions and the collections brought back by them, that we are enabled now to draw up general geological maps of the world. The eastern extremity of the carboniferous rocks in the Polar area can now be mapped out with as much certainty as the Pennine chain or any part of the centre of England. This is the real and ultimate philosophy of all geological explorations—to be able to put one's finger on certain points on the globe, and say, "This or that is composed of such and such a group of rocks." It was in this way that the great maps of Marcou, Sir Roderick Murchison, Dumont, and other eminent geologists, were made, not only by personal examination of the places, but by examining collections that had been brought home by explorers. It is interesting to know that from Berg Island Captain Markham brought home thirty species of carboniferous fossils, every one of which can be matched in the Pennine chain in Derbyshire and Yorkshire, and the same may be said of the collections of Von Keyserling in Petchora Land in Northern Russia. From Barents Island we have, I think, fourteen or fifteen species, and we now know that the northern extremity of Novaya Zemlya is composed entirely of carboniferous rocks, which dip beneath the sea under Franz Josef Land towards the Pole. I wonder how Captain Markham was able to obtain the specimens, for those from the other ten localities are made up of metamorphic rocks, gneiss, clay-slate, etc., which are inorganic. The identification of these fossils, however, is so complete and certain that the history of these northern rocks now begins to be perfectly well known.

H.

NOTES ON THE INSECTS

Collected by Captain A. H. Markham, R.N.

By Robert McLachlan, F.R.S.

During his recent cruise Captain Markham collected a few insects in various localities in Novaya Zemlya, some of which are especially interesting as indicating a richer insect fauna than might have been expected, considering latitude combined with insular position. It has been impossible for me to determine all with certainty, especially the obscure *Diptera*. I have reason to believe the entomology of Novaya

Zemlya is now being worked out by Swedish entomologists, who are particularly fitted for the task. The materials before me, perhaps, indicate, in some respects, affinity with a circumpolar fauna, rather than with that of Lapland or Siberia, as restricted. The three species of Butterflies are especially interesting, for I am not aware that these insects had been previously noticed in the islands.

HYMENOPTERA.

Bombus, sp. ?—One example from Schubert Bay, 4th August. Very like the North American *B. ternarius*, Say, and perhaps not distinct therefrom.

COLEOPTERA.

Homalium, sp. ?—One example from Cairn Harbour, 20th June. This was the only beetle found, but others have been vaguely indicated by other voyagers.

LEPIDOPTERA.

Colias Werdandi, Zetterstedt.—One fine example from Schubert Bay, 4th August; a species (or form) known from Lapland.

Argynnis Chariclea, Schneider.—One fine example from the same locality, 4th August. *A. Chariclea* appears to be a protean species; this example more resembles some of the forms from Arctic America than that usual in Lapland.

Argynnis improba, Butler.—Three worn examples from the same locality and at same date. This species (?) was originally described from examples from Arctic America, and those now before me agree in all respects therewith. Possibly it may be only a small Arctic form of *A. Frigga*, Thunberg; at any rate, that is its nearest ally.

Anarta Richardsoni, Curtis.—One fine example from same locality and at same date. Common to both boreal Europe and Arctic America.

Anarta lapponica, Thunberg?—One very much worn example (probably not to be identified with certainty) appears to agree with *lapponica* in some respects. It is from the same locality as those above mentioned, and was found at same date.

Psycophora Sabini, Kirby.—Three examples, two from Matyushin Shar, 29th July, and one from Schubert Bay, 4th August. An Arctic American species (found up to 82° N. latitude), and apparently not identical with anything described from the European fauna.

In addition to these, there is also one example of some species of *Tineina* from Brenta Bay, 2nd August, utterly rubbed, and not recognizable.

TRICHOPTERA.

Apatania, sp.?—Two very large examples from Brenta Bay, 2nd August, and one scarcely more than half the size from Cape Hessen, 12th August. All are females, and without the other sex it is almost impossible to separate species of this genus. Also it is difficult to say whether these three examples represent two species, and whether one of them is, or is not, identical with the *A. arctica*, Boheman, known from Spitzbergen, Lapland, etc., but only the female. I am strongly of opinion that parthenogenetic generation occurs in *Apatania*, which would tend to prevent the extinction of the forms in Arctic latitudes (see my "Revision and Synopsis of European *Trichoptera*," p. 211, and Supplement, p. xlvi.).

Many years ago I saw two other species of *Trichoptera* from Novaya Zemlya, collected by M. Oulianine, a Russian naturalist. One was *Brachycentrus subnubilus*, Curtis, and the other a *Hydropsyche*.

DIPTERA.

These insects form the bulk of the collection. They have been examined by Mr. R. H. Meade, who kindly furnishes the following list:—

Tipula oleracea, L.?—One ♂ from Matyushin Shar, 21st July, one ♀ from Cairn Harbour, 22nd August (perhaps a new species).

Tipula, sp.?—Resembles *variipennis*. One ♀ from Cape Hessen, 12th August.

Tanypus, sp. nov.?—♂ ♀ from Lystina Island, 1st July.

Tanypus nudipes, Zetterstedt?—One ♀ from Matyushin Shar, 22nd July.

Sciara, sp.?—One example from Lystina Island, 7th July.

Lasiops glacialis, Zett.—One ♀ from Cairn Harbour, 20th June.

Scatophaga villipes, Zett.?—One ♀ from Matyushin Shar, 23nd July.

Leria geniculata, Zett.—One ♂, two ♀, from Nameless Bay, 14th June.

There is also a pupa of *Œstrus tarandi* (the reindeer fly), from Matyushin Shar, 28th July.

MALLOPHAGA.

Trinoton conspurcatum, Nitzsch.—The only bird-louse is an example of this species, found on *Anser segetum*, locality Matyushin Shar.

I.

NOTE ON THE FISHES.

BY DR. GÜNTHER, F.R.S.

THREE species of fishes were obtained; they are included, as Novaya Zemlya fishes, in the list prepared for T. von Heuglin in "Reisen nach dem Nordpolarmeer," vol. iii. p. 202.

1. *Gadus fabricii.* From Matyushin Shar; a common circumpolar species.

2. *Mallotus villosus.* A specimen half eaten by a gull.

3. *Salmo alpinus.* Of this char an adult, half grown, and several young specimens were brought home in splendid condition. The adult specimen is nearly three feet long, and was caught with the fly, like the second half-grown example, in Lissadell Harbour. The young specimens were obtained in a fresh-water pond at Schubert Bay.

The Novaya Zemlya char is one of the finest specimens of the genus, and is sufficiently abundant to employ the crews of a number of Russian vessels. Compared with specimens of *S. alpinus* from Lapland and Iceland, the Novaya Zemlya specimens show a somewhat shorter pectoral, and a rather lower dorsal fin. The pyloric appendages are unusually wide, and forty-one in number. The contents of the stomach proved to consist of loddes (*Mallotus*) and codlings (*Gadus fabricii*).

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THE END.

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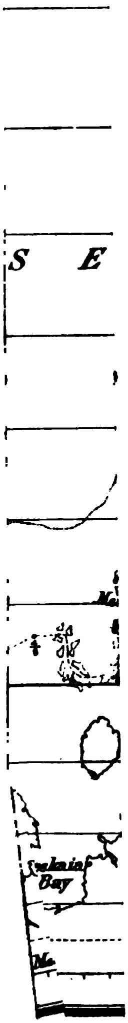
S E
Bay